Series 1950, No. 6

Issued December 1959

SOIL SURVEY

Coahoma County Mississippi

OUR SOIL ★ OUR STRENGTH

UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
In cooperation with
MISSISSIPPI AGRICULTURAL EXPERIMENT STATION

HOW TO USE THE SOIL SURVEY REPORT

THIS SURVEY of Coahoma County will help you plan the kind of farming that will protect your soils and provide good yields. It describes the soils; shows their locations on a map; and tells what they will do under different kinds of management.

Find your farm on the map

In using this survey, start with the index to map sheets in the back of this report. This is a small map of the county on which numbered rectangles have been drawn to show where each sheet of the large map is located. The sheets of the large map, if laid together, make a large photograph of the county. You can see woods, fields, roads, rivers, and many other landmarks on this map.

When you have found the map sheet for your farm, you will notice that boundaries of the soils have been outlined and that there is a symbol for each kind of soil. All areas marked with the same symbol are the same kind of soil, wherever they appear on the map.

Suppose you have found on your farm an area marked with the symbol Aa. You learn the name of the soil this symbol represents by looking at the map legend. The symbol Aa identifies Alligator clay, level phase.

Learn about the soils on your farm

Alligator clay, level phase, and all the other soils mapped are described in the section, Descriptions of Soils. Soil scientists walked over the fields and through the woodlands. They dug holes and examined surface soils and subsoils; measured slopes with a hand level; noted differences in growth of crops, weeds, brush, or trees; and, in fact, recorded all the things about the soils that they believed might affect their suitability for farming. They drew lines on the aerial photographs to show the boundaries of the soils.

After they mapped the soils, the scientists consulted farmers and others who work with farmers, and then they placed the soils in capability units. A capability unit is a group of similar soils that need and respond to about the same kind of management and that require similar protection from erosion.

For example, Alligator clay, level phase, is in capability unit 22 (IIIw-11). Turn to the section, Management of Soils, and read what is said about the soils of capability unit 22 (IIIw-11). You will want to study the table, which tells you how much you can expect to harvest from soils of each unit under two levels of management. In columns A are yields to be expected under prevailing management, and in columns B are yields to be expected under improved management.

Make a farm plan

For the soils on your farm, compare your yields and farm practices with those given in this report. Look at your fields for signs of runoff, erosion, or poor drainage. Then decide whether or not you need to change your methods. The choice, of course, must be yours. This survey will aid you in planning new methods, but it is not a plan of management for your farm or for any other farm in the county.

If you find that you need help in farm planning, consult the local representative of the Soil Conservation Service or the county agricultural agent. Members of the staff of your State agricultural experiment station and others familiar with farming in your county will also be glad to help you.

This soil survey was made as part of the technical assistance furnished to the Coahoma County Soil Conservation District. Fieldwork for this survey was completed in 1950. Unless otherwise specified, all statements refer to conditions in the county at that time.

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SOIL SURVEY OF COAHOMA COUNTY, MISSISSIPPI

Field Survey by C. G. MORGAN, E. J. McNUTT, and K. R. HARRIS, Mississippi Agricultural Experiment Station; T. W. GREEN and A. B. MAXWELL, Soil Survey,[1] Bureau of Plant Industry, Soils, and Agricultural Engineering; and R. H. WELLS and J. J. PITTS, Soil Conservation Service, United States Department of Agriculture

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United States Department of Agriculture in cooperation with the Mississippi Agricultural Experiment Station

COAHOMA COUNTY, in the northwestern part of Mississippi, is in the flood plain area of the Mississippi River. The county is roughly triangular in shape. It is bounded on the northwest by the Mississippi River, on the north by Tunica County, on the east by Quitman and Tallahatchie Counties, and on the south by Sunflower and Bolivar Counties (fig. 1).

Because of its low elevation, this area has always been subject to flooding. After the levees were built, however, it became more productive agriculturally. Many large plantations are now located in the county.

The total amount of rainfall is greater than that needed for the best growth of plants. Nevertheless, the rainfall is distributed unevenly throughout the year so that drainage is needed in many places during the winter and spring, and irrigation is needed during the summer. Cotton has always been the leading crop in the county, but oats, corn, hay, rice, and pasture are increasing in acreage.

The soils in the county are forming from alluvium deposited by the river. They contain a good supply of plant nutrients. They are fine textured and generally have no rocks to interfere with tillage. Bedrock is at great depths so that wells can be drilled easily. There are large supplies of water below the surface. The water has a low, uniform temperature that makes it desirable for air-conditioning purposes.

Soil Associations

In mapping a county or other large tract, it is fairly easy to see definite changes as one travels from place to place. There are many obvious changes, among them changes in shape, gradient, and length of slopes, in the course, depth, and speed of the streams, in the width of the bordering valleys, in kinds of native plants, and even in the kinds of agriculture. With these more obvious changes, there are less easily noticed changes in the patterns of soils. The soils change along with the other parts of the environment.

By drawing lines around the different patterns of soils on a small map, one may obtain a map of the general soil areas, or, as they are sometimes called, soil associations. Such a map is useful to those who want a general idea of the soils, who want to compare different parts of a county, or who want to locate large areas suitable for some particular kind of agriculture or other broad land use.

The four soil associations, or kinds of soil patterns, in Coahoma County, are shown on the colored map at the back of this report. The areas are named for the major soil series in them, but soils of other series may be present in any of the associations. Also, the major soil series in one area may occur in other areas. The Crevasse-Robinsonville-Commerce-Mhoon association and the Bosket-Dubbs-Dundee-Forestdale association are the most important agricultural areas. The soils of the Alligator-Sharkey-Tunica-Dowling association need drainage to make them better suited to cropping. Most of the association made up of Alluvial lands is in forest.

1. Crevasse-Robinsonville-Commerce-Mhoon

This association consists of poorly drained to excessively drained, neutral to mildly alkaline soils of the first bottoms. The soils are predominantly nearly level. They occur on recent natural levees. The parent material was medium-textured to coarse-textured, stratified alluvium deposited by the Mississippi River. The soils have not been in place long enough for well-defined soil profiles to form.

The Crevasse soils, which make up only a small part of the association, are coarse textured, and consequently they are excessively drained. They occur near old levee breaks.

The Robinsonville soils make up about 20 percent of the association. They are moderately well drained to well drained. They have developed from medium-textured alluvium and are fairly free of mottles throughout the profile.

The Commerce soils make up about 70 percent of the association. These soils are somewhat poorly drained to moderately well drained. They have developed from medium-textured sediments, and mottles occur near the surface.

The Mhoon soil, which is the only one of this series in

[1] Soil Survey was transferred to the Soil Conservation Service on November 15, 1952.

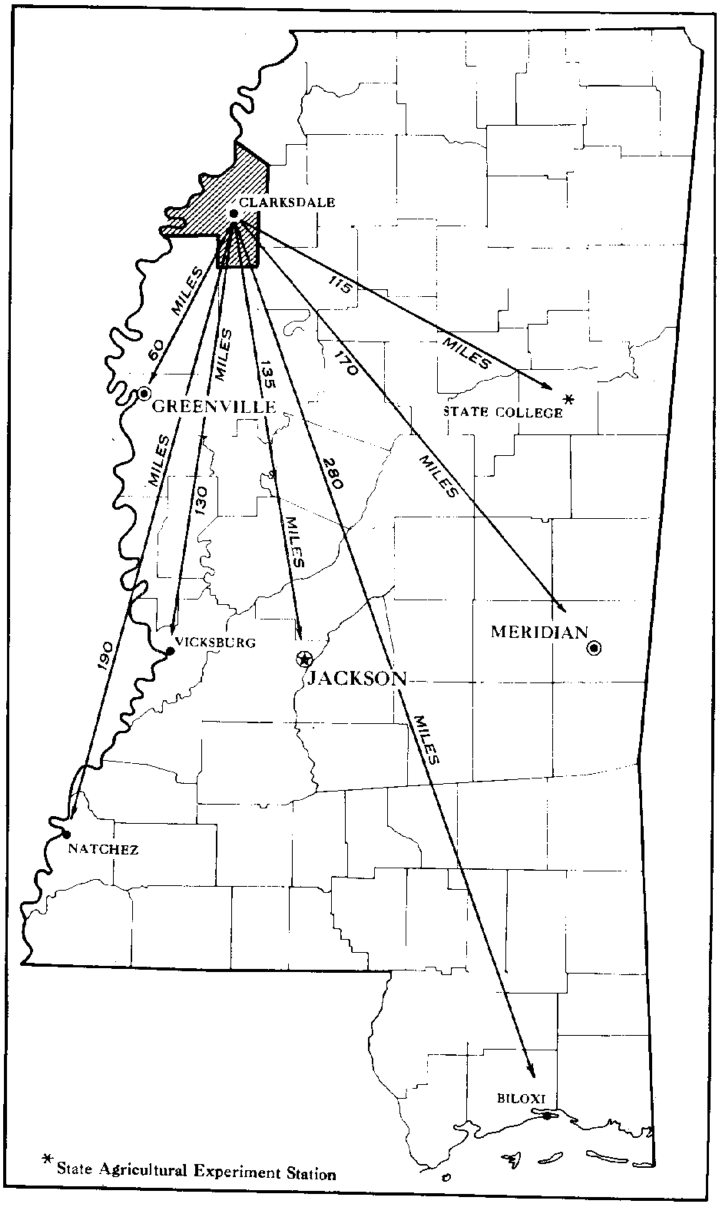

***Figure 1.*—Location of Coahoma County in Mississippi.**

the county, is limited in acreage. It generally occurs in areas near the Commerce and Sharkey soils and is somewhat poorly drained to poorly drained.

The soils in this association are among the best for agriculture of any in the county. Approximately 95 percent of the acreage is in crops or pasture. The principal crops are cotton, soybeans, small grains, corn, and other crops grown locally. Yields are high on most of the soils if good management is practiced. The forest cover consists of hickory, elm, maple, redgum, pecan, cottonwood, sycamore, and post, red, and willow oaks.

2. Alligator-Sharkey-Tunica-Dowling

This association consists of predominantly nearly level, poorly drained to somewhat poorly drained slack-water clays. The areas occur on low bottoms. The soils are fine textured. They have developed mainly from slack-water sediments deposited by the Mississippi River.

The Alligator are the most extensive soils in the association. They comprise nearly 50 percent of the acreage. They are poorly drained and have a highly gleyed profile. These soils occur mainly in the eastern half of the county.

The Sharkey soils are the second most extensive. They too are poorly drained, but they have a darker color throughout than the Alligator soils. The Sharkey soils are mainly in the western half of the county.

The Tunica soils are less extensive than the other soils. They are somewhat poorly drained. Like the Sharkey soils, the Tunica generally occur in the western part of the county. They differ from the Sharkey, however, in being underlain by coarser and better drained materials.

The Dowling clays occur in narrow to broad depressions that are scattered throughout the association. These soils are not suited to cultivation unless they are drained.

About 78 percent of this association has been used for row crops. The rest is still in forest. The principal crops are soybeans, cotton, and small grains, but in recent years a large acreage has been planted to rice or used for pasture. Yields are moderately good if the soils are drained and good management is used. Nevertheless, drainage is a serious problem. The forest cover consists of gum, pecan, and cypress and various kinds of water-tolerant oaks.

3. Bosket-Dubbs-Dundee-Forestdale

This association consists of predominantly nearly level, poorly drained to somewhat excessively drained soils on old natural levees. The soils have formed from medium to moderately fine textured sediments that have been in place long enough for some profile development to have taken place. They occupy nearly level areas or gentle slopes next to old stream runs. Locally, the soils are called "bayou front" land.

The Bosket soils, which make up only a small part of the association, occur nearest the old stream runs. They are the best drained soils of the association.

The Dubbs soils occur next to the Bosket soils. They make up approximately 15 percent of the association. These soils are moderately well drained to well drained. They have developed from moderately fine textured alluvium and have well-oxidized profiles.

The Dundee soils make up about 45 percent of the association. They occur between the Dubbs and Forestdale soils. These soils are somewhat poorly drained to moderately well drained and have mottles in the soil profile.

More than 25 percent of the association is made up of Forestdale soils. These soils are poorly drained and have a gleyed, mottled profile. They occur between the Dundee soils and the slack-water clays of the low bottoms.

A small acreage of Clack, Beulah, and other excessively drained soils is included in this association.

The soils of this association are among the most desirable in the county for agriculture. More than 90 percent of the acreage is used for crops and pasture. Cotton and soybeans are the principal crops, but the soils are well suited to most of the other crops grown locally. If management is good, high yields can be obtained on most of the soils over a long period of time. The forest cover consists of redgum, blackgum, hickory, pecan, sycamore, and red, white, and chestnut oaks.

4. Alluvial Lands

This association consists of unclassified alluvial soils that occur between the Mississippi River and its levees. The soils are subject to annual overflows and remain under water for long periods. These overflows generally occur in spring or early in summer.

More than 90 percent of this association is in forest, and the soils were not classified. The principal soils, however, are the Crevasse, Robinsonville, Commerce, Mhoon, Sharkey, Tunica, and Dowling, which are mapped as distinct units in other places in the county. The texture of the surface layers ranges from sand to clay. Internal drainage ranges from slow to very rapid.

Cleared areas are used to grow cotton, corn, and soybeans or are used for pasture. Flooding makes small grains or early crops uncertain. The forest cover consists of cottonwood, sycamore, cypress, pecan, willow, and most kinds of oak and gum trees common to the area.

Management of Soils

This section has five main parts. The first describes the general management of croplands and pastures applicable to all of the soils; the second explains the system the Soil Conservation Service uses in grouping soils according to their capability; it places the soils of Coahoma County in capability units, or, as they are sometimes called, management groups; the third provides estimated yields per acre for the principal crops under common and improved management; the fourth and fifth discuss the management of woodlands and wildlife, respectively.

General Management

Management of Cropland.—Some principles of good management apply to all of the tillable soils in the county. These include the use of a suitable crop rotation, the return of crop residues to the soil, the use of grassed drainageways and of practices to control erosion and to improve drainage, and the application of adequate amounts of fertilizer and lime.

A suitable crop rotation is one that includes vetch, wild winter peas, or other cover crops. The cover crops will help to control erosion and will add organic matter to the soil. They are best planted early in fall and allowed to grow as late in spring as practical. If the maximum benefits are to be derived, the cover crop should be allowed to go to seed. Crops planted after a cover crop has been grown are better able to withstand drought than those that follow other crops. Also, the cover crop helps to make the soil more porous. Suitable rotations are described under each capability unit.

Residues from the crops in the rotation need to be left on the surface to provide a protective covering and to add organic matter to the soil. One of the best ways of handling the crop residues is to shred the materials and distribute them evenly on the surface. The fields should never be burned over.

In addition to using a suitable rotation on the more nearly level soils, a good management practice is to establish sod on the drainage outlets and to seed the steep areas along depressions, streams, and bayous to perennial hay or pasture. The outlets need to be shaped carefully. Also, the rows should be arranged so that the water will be carried off without causing excessive erosion.

Nitrogen is the principal fertilizer needed for most of the crops grown in the county. At the present time, little response is received when phosphate and potash are added to cotton or corn. If larger amounts of nitrogen are added, however, larger amounts of phosphate and potash may be required. Lime is needed for some crops, especially legumes.

Bulletins based on recent experiments with fertilizer can be obtained from the Mississippi Agricultural Experiment Station. The recommendations contained in these bulletins are general, however, and neither take into consideration the natural variations in the soils nor past management. Consequently, they do not provide the specific information needed for applying fertilizer to a particular field. They also do not provide information as to requirements of fertilizer to obtain exceptionally high yields nor do they list the amounts of lime needed to raise the soil reaction to a designated pH. This information can be provided by soil tests.

Soil testing is a free service offered to the farmers of Coahoma County. Sample boxes, mailing cartons, and instructions are available at the office of the county agent.

Management of Pastures.—The raising of livestock, particularly sheep and feeder cattle, has become more important in Coahoma County in recent years. As a result, the acreage in hay and pasture crops has increased.

Many farmers have a large acreage of well-drained, sandy soils and rely mainly on small grains, sudangrass, millet, annual lespedeza, and other annual crops to provide forage. Only a small acreage in the county is in permanent pastures. The permanent pastures are mainly on the banks of bayous or on low, level areas.

Most long-range grazing programs are built around the use of perennial grasses and legumes grown in rotation pastures. In these, the pastures are seeded on soils suited to row or other crops. The pastures are then rotated with field crops.

The most practical mixture for seeding permanent pasture is one that includes both summer and winter perennial grasses. Tall fescue and bermudagrass, grown with a suitable legume, can be used for this purpose. The legume is seeded with the perennial grass to supply nitrogen to the grass and to improve the quality of the forage. Because of the thick, rapid growth of coastal bermudagrass, a winter legume can be grown to supply nitrogen and to supplement the winter pastures.

If the area to be pastured consists of poorly drained, fine-textured soils, a good pasture mixture is (1) tall fescue grown with wild winter peas, white clover, or ladino clover, or (2) coastal bermudagrass grown with wild winter peas or vetch for summer grazing. Johnsongrass, dallisgrass, common bermudagrass, or similar grasses grown with suitable legumes can also be used in the seeding mixture. Small grains, millet, and other annual crops are suitable for finishing feeder cattle or for supplementing the perennial pasture in providing forage for dairy cows.

Capability Grouping of Soils

Capability grouping is a system of classification used to show the relative suitability of soils for crops, grazing, forestry, and wildlife. It is a practical grouping based on the needs, limitations, and risks of damage to the soils, and also on their response to management. There are three levels above the mapping unit in the grouping—unit, subclass, and class.

The capability unit, sometimes called a management group, is the lowest level of grouping. A capability unit is made up of soils similar in kind of management they need, in risk of damage, and in general suitability for use.

The next broader grouping, the subclass, is used to indicate the dominant kind of limitation. The letter symbol "e" indicates that the main limiting factor is risk of erosion if the plant cover is not maintained; "w" means excess water that retards the growth of plants or interferes with cultivation; and "s" shows that the soils are shallow, droughty, difficult to work, or unusually low in fertility.

The broadest grouping, the land class, is identified by Roman numerals. All the soils in one class have limitations and management problems of about the same degree, but of different kinds, as shown by the subclass. All the land classes except class I may have one or more subclasses.

In classes I, II, and III are soils that are suitable for annual or periodic cultivation of annual or short-lived crops. Class I soils are those that have the widest range of use and the least risk of damage. They are level or nearly level, productive, well drained, and easy to work. They can be cultivated with almost no risk of erosion and will remain productive if managed with normal care.

Class II soils can be cultivated regularly but do not have quite so wide a range of suitability as class I soils. Some class II soils are gently sloping; consequently, they need moderate care to prevent erosion. Other soils in class II may be slightly droughty, or slightly wet, or somewhat limited in depth.

Class III soils can be cropped regularly but have a narrower range of use than class II soils. They need even more careful management.

In class IV are soils that should be cultivated only occasionally or only under very careful management.

In classes V, VI, and VII are soils that normally should not be cultivated for annual or short-lived crops but that can be used for pasture or range, as woodland, or for wildlife.

Class V soils are nearly level to gently sloping but are droughty, wet, low in fertility, or otherwise unsuitable for cultivation.

Class VI soils are not suitable for crops because they are steep, or droughty, or otherwise limited; nevertheless, they give fair yields of forage or forest products. Some soils in class VI can, without damage, be cultivated to the extent that fruit trees or forest trees can be set out or pasture crops seeded.

Class VII soils provide only poor to fair yields of forage or forest products.

In class VIII are soils that have practically no agricultural use. Some of them have value as parts of watersheds, as wildlife habitats, or for scenery.

No class V, VI, or VIII soils occur in Coahoma County.

Coahoma County has approximately 79,706 acres of class I soils, and 63,827 acres of class II, 114,929 acres of class III, 35,506 acres of class IV, 935 acres of class VII, and 48,213 acres of unclassified land that is not protected by levees. In addition, 21,684 acres is in swamps, lakes, roads, and towns. These figures suggest that good land use in the county might be to have approximately 133,616 acres in crops, other than grasses and legumes, 142,971 acres in grasses and legumes, and 66,529 acres in trees. The swamps, streams, and lakes can be used as wildlife habitats.

A large part of the acreage considered safe for use as cropland occurs on a ridge-depressional type of topography in which slopes are as much as 7 percent. In these areas there are many minor bluffs, runs of former streams, and short, steep slopes. Many of the soils in these areas are moderately well drained and are medium textured.

The capability classes, subclasses, and units in Coahoma County are given in the following list. Following the list there is a description of each capability unit, the soils that are in it, and some suggestions about how to use and manage the soils.

Class I.—Deep, nearly level, productive soils; suitable for tilled crops and other uses; few or no permanent limitations.
- Unit 1 (I-1).—Nearly level, mostly moderately well drained, loamy soils.
- Unit 2 (I-2).—Nearly level, well-drained soils.

Class II.—Soils that have moderate limitations if tilled; suitable for crops, pasture, and trees.
- Subclass IIe.—Gently sloping soils that have moderate limitations of erosion if tilled.
  - Unit 3 (IIe-1).—Gently sloping, mostly moderately well drained, loamy soils on natural levees.
- Subclass IIs.—Soils somewhat limited by available moisture capacity.
  - Unit 4 (IIs-1).—Nearly level, somewhat droughty soils.
  - Unit 5 (IIs-2).—Nearly level silty clays and clays; mostly somewhat poorly drained.
  - Unit 6 (IIs-3).—Somewhat poorly drained and poorly drained silt loam on old natural levees.
  - Unit 7 (IIs-4).—Somewhat poorly drained to poorly drained silty clay loam.
  - Unit 8 (IIs-5).—Nearly level, poorly drained silt loam.
  - Unit 9 (IIs-6).—Nearly level, somewhat poorly drained to moderately well drained silty clay loams.
- Subclass IIw.—Moderately wet soils.
  - Unit 10 (IIw-1).—Level, somewhat poorly drained to moderately well drained silty clay loam.
  - Unit 11 (IIw-3).—Somewhat poorly drained silt loam.

Class III.—Soils that have severe limitations and that require careful management if tilled; suitable for crops, pasture, and trees.
- Subclass IIIe.—Sloping soils that have a high risk of erosion if tilled.
  - Unit 12 (IIIe-2).—Gently sloping, well-drained very fine sandy loams on natural levees.
  - Unit 13 (IIIe-3).—Gently sloping, somewhat poorly drained to moderately well drained silty clay loams.
  - Unit 14 (IIIe-5).—Gently sloping, somewhat poorly drained to poorly drained silty clay loam.
  - Unit 15 (IIIe-6).—Gently sloping, poorly drained, clayey soils.
- Subclass IIIs.—Soils limited by moisture capacity or low fertility.
  - Unit 16 (IIIs-1).—Gently sloping, slightly droughty soils.
  - Unit 17 (IIIs-2).—Gently sloping, somewhat poorly drained, clayey soil.
  - Unit 18 (IIIs-4).—Nearly level, clayey soils.
- Subclass IIIw.—Wet soils that require artificial drainage if they are tilled.
  - Unit 19 (IIIw-1).—Level, somewhat poorly drained to moderately well drained silty clay soil.
  - Unit 20 (IIIw-3).—Level, somewhat poorly drained to poorly drained silt loam.
  - Unit 21 (IIIw-5).—Level, somewhat poorly drained to poorly drained silty clay loam.
  - Unit 22 (IIIw-11).—Level, poorly drained, clayey soils.

Unit 23 (IIIw–13).—Mixture of poorly drained soils in depressions.

Class IV.—Soils that are suited to pasture or trees but if tilled are suitable for only limited or occasional cultivation and with severe limitations.

Subclass IVe.—Soils severely limited by risk of erosion if cover is not maintained.

Unit 24 (IVe–3).—Sloping, slightly droughty, loamy soils.

Subclass IVw.—Soils subject to fairly frequent overflow.

Unit 25 (IVw–1).—Poorly drained, clayey soil in depressions.

Class VII.—Soils severely limited for pasture or trees.

Subclass VIIs.—Soils severely limited by low capacity for available moisture.

Unit 26 (VIIs–1).—Nearly level, droughty soils on natural levees.

Capability units

The soils of Coahoma County have been placed in 26 capability units, each of which is discussed in the following pages. All of the soils in one unit need about the same kind of management, respond to management in about the same way, and have essentially the same limitations. In each unit the characteristics and suitability of the soils for crops are discussed and some suggestions are given for management. The crop rotations mentioned are given as examples. They are not the only rotations suited to the soils in the unit.

CAPABILITY UNIT 1 (I–1)

This capability unit consists of deep, nearly level, loamy soils that are moderately well drained. In most places the soils have surface layers of silt loam or very fine sandy loam that are at least 6 inches thick. The subsoils are thick and range in texture from silty clay or silt loam to sandy clay or sandy clay loam. The lower part of the profile is made up of sandier materials. Slopes are ½ to 3 percent. The following soils are in this capability unit:

Commerce silt loam, nearly level phase.
Dubbs silt loam, nearly level phase.
Dubbs very fine sandy loam, nearly level phase.
Dundee silt loam, nearly level phase.
Dundee very fine sandy loam, nearly level phase.

The soils of this group are easy to work. Surface runoff is no problem. Although the soils are generally well drained, drainage ranges to somewhat poor. The capacity of the soils for holding available moisture is moderate to high. Permeability is moderate where the soil does not contain a plowpan. The content of organic matter is low, but the soils are moderate in natural fertility. Except for the Commerce soil, which is neutral to mildly alkaline, the soils are strongly acid to slightly acid.

These soils are among the best in the county for row crops and pasture. They are well suited to cotton, corn, soybeans, sorghum, and small grains (fig. 2). They are also well suited to vetch and wild winter peas grown as winter cover crops or with small grains. Pastures of bermudagrass, dallisgrass, johnsongrass, whiteclover, vetch, and wild winter peas make good yields on these soils. Sudangrass and similar summer grasses do well. The

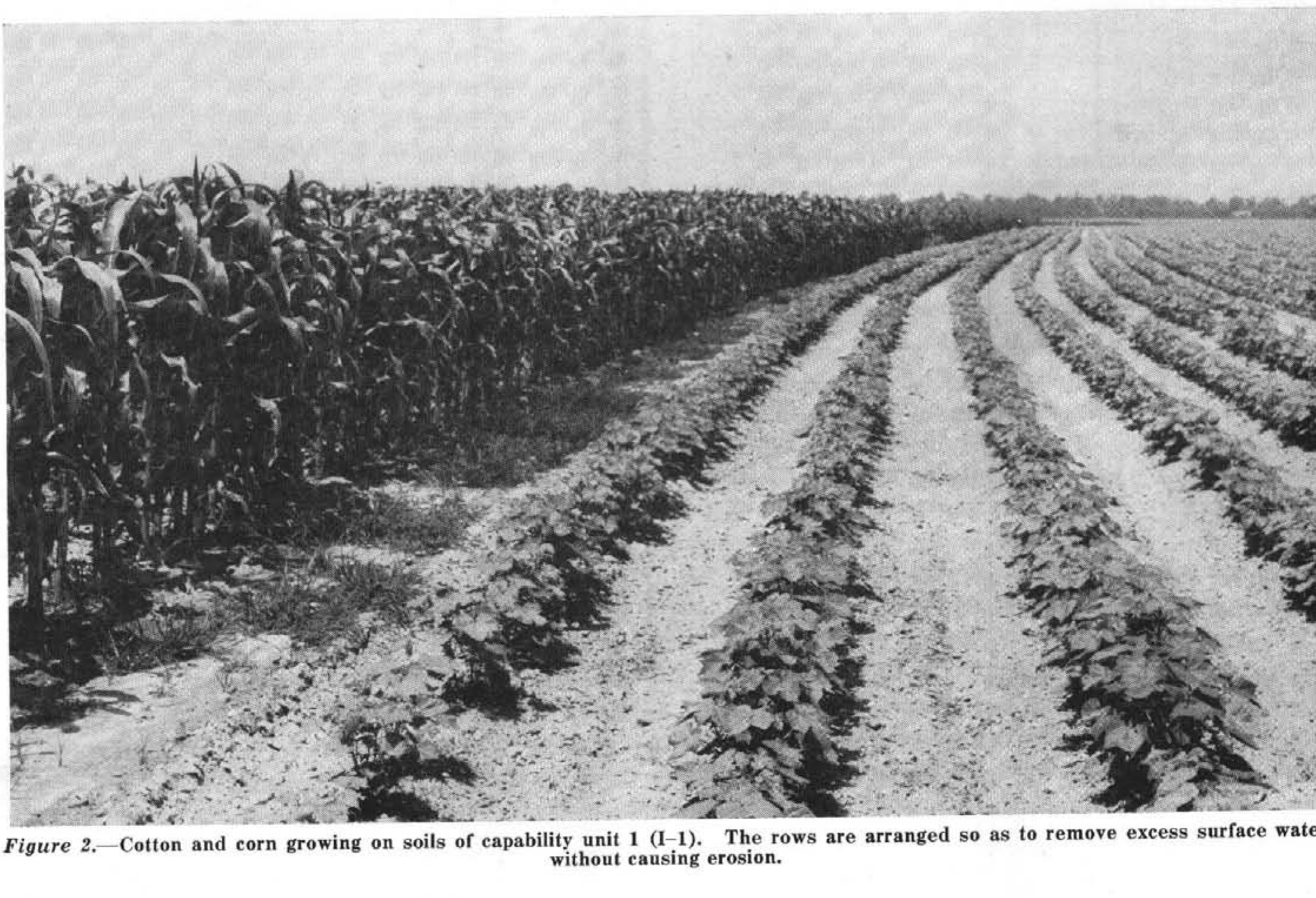

Figure 2.—**Cotton and corn growing on soils of capability unit 1 (I–1). The rows are arranged so as to remove excess surface water without causing erosion.**

soils are only fairly well suited to annual lespedeza, alfalfa, red clover, and tall fescue.

The trees that grow well are sweetgum, red, water, and white oaks, and similar hardwoods.

Suitable crop rotations are (1) 6 years of row crops and 3 years of sod crops, and (2) 1 year of row crops and 1 year of oats seeded with vetch.

These soils can be worked easily within a wide range of moisture content. If left bare, however, they tend to crust and pack after rains. The silt loams form such a hard crust at times that stands of crops are poor. Early in spring is the best time to plow the soils to prepare them for planting. A hard, compact layer, or plowpan, 2 to 14 inches thick, may form in places just below the surface layer. This can be shattered by subsoiling late in fall when the soil is dry.

The normally low content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Nonlegume crops respond to applications of nitrogen fertilizer. In most places the acidity of the soils must be corrected for the best yields of alfalfa and some other legumes.

CAPABILITY UNIT 2 (I-2)

This capability unit is made up of nearly level, well-drained soils. The surface layers consist of very fine sandy loam that is at least 6 inches thick in most places. The subsoils range from silty clay loam to fine sandy loam. Slopes range from ½ to 3 percent. The following soils are in this capability unit:

Bosket very fine sandy loam, nearly level phase.
Robinsonville very fine sandy loam, nearly level phase.

The soils have a favorable supply of moisture except during dry periods when they are slightly droughty. Surface runoff is no problem, and permeability is moderate to moderately rapid where the soils do not have a plowpan. The capacity for holding available moisture is moderate. The content of organic matter is low, and natural fertility is moderate to high. The soils are medium acid to mildly alkaline.

These soils are well suited to cotton, early truck crops, and small grains and are fairly well suited to early corn, vetch, and wild winter peas. Permanent pastures of bermudagrass, johnsongrass, and crimson clover make good yields. The soils are fairly well suited to whiteclover, vetch, and wild winter peas but are poorly suited to tall fescue, alfalfa, dallisgrass, annual lespedeza, and the summer grasses. Late-maturing corn, soybeans, sorghum, millet, and sudangrass are uncertain crops because of limited moisture.

Trees that grow well on these soils are sweetgum, water oak, and similar hardwoods.

Suitable crop rotations are (1) 3 years of row crops and 3 years of sod crops; (2) early truck crops or early corn, fallow, and oats and vetch seeded in fall; and (3) 2 years of cotton and 3 years of oats seeded with vetch.

These soils are easy to work and can be worked within a wide range of moisture conditions. If left bare, they tend to pack after rains and to form a hard, compact layer, or plowpan, 2 to 4 inches thick, just below the surface layer. If the plowpan is not shattered by subsoiling, preferably in the dry fall, it restricts the growth of plant roots and the internal movement of water below the surface layer. W-type ditches are needed, and rows ought to be arranged so as to conserve moisture and to remove excess surface water without causing erosion.

Additions of organic matter will help to improve the soil structure and to increase the available moisture-holding capacity, rate of infiltration, and bacterial activity. It also reduces crusting of the soil. The content of organic matter can be increased by turning under crop residues, by including a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 3 (IIe-1)

This capability unit consists of gently sloping, mostly moderately well drained, loamy soils on old or recent natural levees. The surface layers consist of silt loam or very fine sandy loam that is 4 to 7 inches thick. The texture of the subsoils ranges from silty clay to silt loam. The subsoil overlies sandier material in most places. These soils occur in fairly long, narrow strips in areas that have slopes of 3 to 7 percent. The following soils are in this capability unit:

Commerce silt loam, gently sloping phase.
Dubbs very fine sandy loam, gently sloping phase.
Dundee very fine sandy loam, gently sloping phase.
Dundee silt loam, gently sloping phase.

These soils are easy to till. Surface runoff needs to be controlled (fig. 3). Drainage is predominantly moderately good, but it ranges from somewhat poor to good. Permeability is moderate where the soils do not have a plowpan; the available moisture-holding capacity is moderate to high. The content of organic matter is low, but the natural fertility of the soils is moderate. These soils are predominantly strongly acid to slightly acid.

The soils in this group are well suited to cotton, corn, soybeans, small grains, millet, and sudangrass. Vetch and wild winter peas are good to grow as winter cover crops or with small grains. Pastures of bermudagrass (fig. 4), johnsongrass, dallisgrass, whiteclover, winter legumes, and summer grasses yield well on these soils. The soils are only fairly well suited to annual lespedeza, tall fescue, alfalfa, and red clover.

Trees that grow well on these soils are sweetgum, red, water, and white oaks, and other hardwoods.

Suitable crop rotations are (1) 3 years of row crops and 3 years of sod crops, and (2) 1 year of row crops and 1 year of oats seeded with vetch.

These soils are easy to work, and they can be worked within a wide range of moisture conditions. If they are left bare, they tend to crust and pack after rains. The silt loams crust so hard at times that stands of crops are poor.

The slopes of these soils are strong enough to cause some areas to become slightly to moderately eroded if clean-tilled crops are grown continuously. Rows arranged on the contour are needed to prevent further erosion and to conserve moisture. W-type ditches and grassed waterways are needed as outlets for the rows.

The content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Nonlegume crops respond to nitrogen

Figure 3.—**Area that shows need for a change in land use. Measures should be taken to control erosion on the slopes to the right of the road that runs through the field and to protect class I soils to the left of the road.**

fertilizer. In most places the acidity of the soils must be corrected for the best yields of alfalfa and some other legumes.

CAPABILITY UNIT 4 (IIs-1)

This capability unit consists of nearly level, somewhat droughty soils on old or recent natural levees. The soils have surface layers that range in texture from sandy loam to silty clay loam and that are at least 6 inches thick in most places. The subsoils range from silty clay or sandy clay in the Dundee soils to loamy sand in the small areas of Clack soils. Slopes range from ½ to 3 percent. The following soils are in this capability unit:

Beulah silty clay loam, nearly level overwash phase.
Beulah very fine sandy loam, nearly level phase.
Dundee-Clack soils, nearly level phases.
Robinsonville-Crevasse soils, nearly level phases.

These soils are easy to till. Surface runoff is no problem, but drainage ranges from somewhat poor to excessive. Permeability ranges from moderately slow to rapid, and the available moisture-holding capacity is low to moderate. The content of organic matter is low, and natural fertility is low to moderate. These soils are medium acid to mildly alkaline.

Several crops grow well on these soils in winter and early in spring when moisture is normally abundant. The soils are suited to only a few crops, however, during the dry summer months. The crops to which they are best suited are early truck crops, small grains for grazing, and vetch. They are fairly well suited to cotton, early corn, and wild winter peas. Soybeans, late corn, sudangrass, and millet are uncertain crops.

Sod crops to which these soils are well suited are bermudagrass, johnsongrass, and crimson clover, but they are not suited to dallisgrass, annual lespedeza, whiteclover, tall fescue, and red clover. The trees that grow well are ash, cottonwood, elm, hackberry, sweetgum, and red, water, and white oaks.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops consisting of grasses and legumes; and (2) 1 year of row crops followed by 1 year of oats or ryegrass with vetch left on the ground, and 1 year of volunteer vetch and native grasses.

These soils are easy to work and can be worked within a wide range of moisture content. If they are left bare, they tend to crust and pack after rains. Early in spring is the best time to prepare the soils for planting. Rows should be laid out carefully, with V-type and W-type ditches for outlets, to conserve water in some seasons and also to remove excess surface water without causing erosion.

The low content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Most nonlegume crops respond to applications of nitrogen fertilizer.

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Figure 4.—**Sheep grazing on soils of capability unit 3 (IIe-1). The forage consists of bermudagrass and whiteclover combined, a new pasture crop in this area.**

CAPABILITY UNIT 5 (IIs-2)

This capability unit consists of predominantly somewhat poorly drained silty clays and clays that are on recent natural levees or in slack-water areas. The soils have clayey surface layers, and the subsoils consist generally of clay that overlies coarser materials that occur at depths of 14 to 24 inches. Slopes range from ½ to 3 percent. The following soils are in this capability unit:

Commerce silty clay, nearly level phase.
Sharkey clay, nearly level phase, shallow over sand.
Tunica silty clay, nearly level phase.

The soils of this group are difficult to till because they crack when dry and are very sticky when wet. Surface runoff is no problem. Drainage ranges from somewhat poor to moderately good. Permeability is slow to moderately slow, and the available moisture-holding capacity is high to very high. The content of organic matter is low, but the natural fertility is moderate. The reaction ranges from slightly acid to mildly alkaline.

These soils are well suited to pasture and hay crops, but row crops are uncertain. They are well suited to cotton, sorghum, and soybeans, however, and to small grains, rice, vetch, and wild winter peas. They are fairly well suited to corn, annual lespedeza, millet, and sudangrass. Sod crops that grow well are tall fescue, johnsongrass, dallisgrass, alfalfa, white and red clovers, and winter legumes, but the soils are only fairly well suited to summer grasses and annual lespedeza. Sweetgum, water oak, hackberry, elm, and ash are the trees that grow best.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops; (2) 2 years of nonlegume row crops and 1 year of soybeans, with oats and red clover planted in the fall of the third year, and fallow the remainder of the fourth year after the oats have been harvested; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

Good tilth is difficult to maintain because of the texture and consistence of the soils. Rows should be arranged so that they empty into V-type and W-type ditches to prevent ponding and to remove excess surface water without causing erosion. Deep plowing late in fall or early in winter is desirable because it prevents the soils from clodding excessively at planting time. High seedbeds help to drain and aerate these soils.

The content of organic matter can be increased by turning under crop residues and by using suitable sod crops in the cropping system. Nitrogen is the only fertilizer needed in most places.

CAPABILITY UNIT 6 (IIs-3)

The only soil in this capability unit is Forestdale silt loam, nearly level phase. This soil is somewhat poorly drained to poorly drained. It occurs in small to large areas on old natural levees on slopes of ½ to 3 percent.

The surface layer is generally silt loam that is about 5 inches thick in most places. Small areas that have a surface layer of very fine sandy loam also occur. The subsoil is a thick silty clay that overlies coarser textured materials that occur at depths of 24 to 27 inches.

This soil is easy to work. In some of the more level areas, surface runoff is slow. Permeability is slow, and the capacity for holding available moisture is high. The content of organic matter is low, but the natural fertility is moderate. This soil is medium to strongly acid.

This soil is well suited to soybeans, sorghum, small grains, vetch, and wild winter peas. It is fairly well suited to corn, cotton, rice, sudangrass, and millet. Pasture plants to which it is well suited are bermudagrass, johnsongrass, and winter legumes, but the soil is only fairly well suited to tall fescue, dallisgrass, red and white clovers, annual lespedeza, and the summer grasses.

Trees that grow well on this soil are sweetgum, water oak, hackberry, elm, and ash.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod; and (2) 2 years of nonlegume row crops, soybeans the third and fourth years, oats and winter legumes seeded in the fall of the fourth year, and fallow the rest of the fifth year after the oats are harvested.

This soil is easy to till, but if it is left bare it will pack, crust, puddle, and erode after rains. In places the crusts are so hard that stands of crops are poor. Also, tillage is sometimes delayed for several days after rains because of the slow internal drainage. In some places a hard, compact layer, or plowpan, 2 to 14 inches thick, forms just below the plow layer. This should be shattered by subsoiling during the dry months late in fall. Rows that empty into V-type or W-type ditches will help to remove excess surface water.

The content of organic matter should be increased to improve soil structure and infiltration and to reduce puddling, crusting, and packing. This can be done by turning under the residues of crops, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Nonlegume crops respond to nitrogen fertilizer. In most places the acidity of the soil must be corrected for the best yields of alfalfa and some other legumes.

CAPABILITY UNIT 7 (IIs-4)

The only soil in this capability unit, Forestdale silty clay loam, nearly level phase, is somewhat poorly drained to poorly drained. It occurs in small to large areas on natural levees on slopes of ½ to 3 percent.

The surface layer is silty clay loam. The subsoil is a thick layer of silty clay that overlies coarser textured materials that occur at depths of about 25 inches.

In some of the more level areas, surface runoff is slow. Permeability is slow, and the capacity for holding moisture is high to very high. The content of organic matter is low, but the soil has a moderate supply of plant nutrients. The soil is medium acid to strongly acid. It is somewhat difficult to till as it cracks when dry and is plastic when wet.

This soil is well suited to soybeans, annual lespedeza, rice, small grains, vetch, wild winter peas, and sorghum. It is only fairly well suited to cotton, sudangrass, and millet and generally is not suited to corn and alfalfa. Pasture plants to which it is well suited are bermudagrass, johnsongrass, and winter legumes, but the soil is only fairly well suited to tall fescue, dallisgrass, red and white clovers, and the summer grasses.

Forest trees on this soil are sweetgum, water oak, and similar hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod crops; (2) 2 years of cotton, soybeans the third and fourth years, with oats seeded in the fall of the fourth year, and fallow the remainder of the fifth year after the oats have been harvested in spring; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

Rows that empty into V-type or W-type ditches should be arranged so as to remove excess surface water without causing erosion. Deep plowing and the use of high seedbeds will help to drain and aerate this soil.

The content of organic matter should be increased to improve infiltration, soil structure, tilth, and bacterial activity, and to reduce the crusting of the soil. This can be done by turning under crop residues and by using a suitable sod in the cropping sequence. In most places nitrogen is the only fertilizer needed. Alfalfa and some other legumes require lime in some places.

CAPABILITY UNIT 8 (IIs-5)

The only soil in this capability unit is Sharkey silt loam, nearly level overwash phase. This clayey slackwater soil is covered by an overwash of 6 to 20 inches of silt loam. Slopes range from ½ to 3 percent.

Surface runoff is no problem, but permeability is moderately slow in the surface layer and very slow in the underlying layers. The capacity for holding available moisture is high to very high. The content of organic matter is low, but the natural fertility is moderate. The soil is slightly acid to neutral.

This soil is well suited to soybeans, small grains, rice, and sorghum, and to tall fescue, bermudagrass, johnsongrass, dallisgrass, whiteclover, and wild winter peas. It is fairly well suited to cotton, corn, sudangrass, millet, and annual lespedeza, and to red clover, vetch, and alfalfa.

Trees that grow well on this soil are sweetgum, water oak, hackberry, elm, and ash.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod; and (2) 2 years of nonlegume row crops, soybeans the third and fourth years, with oats and winter legumes seeded in the fall of the fourth year, and fallow the rest of the fifth year after the oats have been harvested in spring.

This soil is easy to till, but it crusts, puddles, and packs after rains if it is left bare. It remains cold until late in spring and is wet longer than the other silt loams of the county.

Carefully laid out rows that empty into V-type or W-type ditches will help remove the excess surface water.

The content of organic matter should be increased to improve soil structure and infiltration, to reduce crusting and puddling, and to increase bacterial activity. This can be done by turning under crop residues, by using a suitable sod in the cropping sequence, and by growing winter legumes after clean-tilled crops.

This soil requires deep plowing and frequent cultivation to improve soil aeration. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 9 (IIs-6)

In this capability unit are nearly level, somewhat poorly drained to moderately well drained silty clay loams that occur on recent or old natural levees. The surface layers consist of silty clay loam that is about 4 or 5 inches thick in most places. The subsoils are mostly silty clay or silty clay loam but are coarser textured in places. Slopes range from ½ to 3 percent. The following soils are in this capability unit:

Commerce silty clay loam, nearly level phase.
Dundee silty clay loam, nearly level phase.

Surface runoff is no problem, but permeability is moderately slow. The capacity for holding available moisture is high. The content of organic matter is low, but natural fertility is moderate. The Commerce soil is neutral to mildly alkaline, and the Dundee is medium acid to strongly acid.

The soils are well suited to soybeans, small grains, rice, and sorghum and are fairly well suited to cotton, corn, sudangrass, millet, and annual lespedeza. Pasture plants to which they are well suited are tall fescue, bermudagrass, johnsongrass, dallisgrass, whiteclover, and wild winter peas. The soils are only fairly well suited to red clover, vetch, and alfalfa.

Trees that grow well on these soils are ash, elm, hackberry, sweetgum, and water oak.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod; and (2) 2 years of nonlegume row crops, soybeans the third and fourth years, oats and winter legumes planted in the fall of the fourth year, and fallow the remainder of the fifth year after the oats are harvested in spring.

These soils are somewhat difficult to till since they tend to break into clods. They should not be worked when wet. Rows should be arranged and W-type ditches used to remove excess surface water without causing erosion. The content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping sequence, and by growing winter legumes after clean-tilled crops. Most nonlegume crops on these soils will respond to nitrogen fertilizer.

CAPABILITY UNIT 10 (IIw-1)

The only soil in this capability unit is Dundee silty clay loam, level phase. This soil is level and is somewhat poorly drained to moderately well drained. The surface layer is silty clay loam that is 4 to 6 inches thick in most places. The subsoil is a thick silty clay underlain by silty clay loam that occurs at depths of 18 to 26 inches. Slopes are 0 to ½ percent.

Surface runoff is slow and permeability is moderately slow. The capacity for holding available moisture is high. The supply of organic matter is low, but the natural fertility is moderate. This soil is medium acid to strongly acid. It is somewhat difficult to till because of the moderately fine texture of the surface layer.

Except for corn, annual lespedeza, and rice, to which the soil is only fairly well suited, this soil is well suited to all the crops commonly grown in the area. It is also well suited to all the perennial and summer grasses grown locally for pasture, as well as perennial and annual legumes.

Trees that grow well on this soil are ash, elm, hackberry, overcup and water oaks, bitter pecan, and sweetgum.

Suitable crop rotations are (1) 4 years of row crops followed by 2 years of sod; and (2) 3 years of nonlegume row crops, oats seeded in the fall of the third year, soybeans the fourth year after the oats are harvested in spring, oats seeded in fall, and fallow the rest of the fifth year after harvesting the oats.

Rows should be arranged on this soil so as to remove excess surface water without causing erosion. W-type ditches are needed.

The content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping sequence, and by growing winter legumes after clean-tilled crops. Nonlegume crops on this soil will respond to nitrogen fertilizer. In most places the acidity of the soil must be corrected for best yields of alfalfa and some other legumes.

CAPABILITY UNIT 11 (IIw-3)

The only soil in this capability unit is Souva silt loam. This soil is somewhat poorly drained. It occurs in narrow, shallow depressions. Additional amounts of local alluvium are deposited on the soil periodically.

The surface layer ranges in texture from silty clay loam to very fine sandy loam, and in thickness, from 6 to 14 inches. The subsoil is a silty clay loam that in places overlies gleyed silty clay, which occurs at a depth of about 24 inches.

Surface runoff is very slow to ponded, and permeability is slow. The water table is high in places, and the capacity for holding available moisture is high. The content of organic matter and the natural fertility of this soil are both moderate. The soil is medium acid to neutral.

If this soil is drained adequately, it is suited to many kinds of row crops and sod crops. It is suitable for cotton, corn, soybeans, millet, sudangrass, sorghum, bermudagrass, dallisgrass, johnsongrass, whiteclover, vetch, and wild winter peas. It is fairly well suited to tall fescue, annual lespedeza, alfalfa, and red clover.

Trees that grow well on this soil are ash, elm, hackberry, sweetgum, and water oak.

Suitable crop rotations are (1) 6 years of row crops followed by 3 years of sod, and (2) 1 year of cotton or corn followed by 1 year of soybeans.

If this soil is adequately drained, it is easy to work. Nevertheless, tillage may be delayed for several days after heavy rains. Rows should be arranged so as to remove excess water without causing erosion. V- or W-type ditches are needed to prevent ponding and to provide adequate outlets for removing water that collects from adjacent fields.

Care is needed in adding nitrogen fertilizer because too much nitrogen may cause plants to grow excessively. The content of organic matter is greater than in the adjacent higher lying soils.

CAPABILITY UNIT 12 (IIIe-2)

This capability unit consists of gently sloping, well-drained very fine sandy loams on natural levees. The soils occupy long, narrow strips on slopes of 3 to 7 percent. They occur along channels of streams or former streams.

The surface layers are very fine sandy loam, about 4 to 8 inches thick. The subsoils range from silty clay loam to fine sandy loam. The following soils are in this capability unit:

Bosket very fine sandy loam, gently sloping phase.
Robinsonville very fine sandy loam, gently sloping phase.

These soils are easy to till. Moisture is favorable for the growth of plants except during dry spells when the soils are somewhat droughty. Surface runoff should be controlled. Permeability is moderate to moderately rapid except where it is restricted by a plowpan. The capacity for holding available moisture is moderate. The content of organic matter is low, and the natural fertility is moderate. The soils are medium acid to mildly alkaline.

These soils are best suited to early maturing crops; the yields of crops that mature late are sometimes reduced by dry weather. The crops that grow best on these soils are small grains, winter legumes, and truck crops or other early crops. The soils are fairly well suited to cotton and early corn but are not suited to late-maturing corn, soybeans, and summer annual grasses. They are well suited to pasture plants, such as bermudagrass, johnsongrass, and crimson clover, but they are only fairly well suited to whiteclover. The soils are not suited to tall fescue, dallisgrass, and annual lespedeza. Suitable trees on these soils are sweetgum, red, water, and white oaks, and similar hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod, and (2) 1 year of cotton followed by 2 or 3 years of oats and vetch.

These soils are easy to till, and they can be tilled under a wide range of moisture content. Nevertheless, rains will cause them to crust and erode if they are left bare. Rows should be arranged so that surface water will run off and cause only a minimum of loss through erosion. V- or W-type ditches are needed to provide outlets for the rows. Vegetated waterways may be needed in some places.

If the content of organic matter is increased, it will help to improve the soil structure, the capacity for holding available moisture, the speed of infiltration, and bacterial activity. It will also reduce crusting of the soil. Organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. In most areas of these soils, nitrogen is the only fertilizer needed.

CAPABILITY UNIT 13 (IIIe-3)

This capability unit consists of gently sloping, somewhat poorly drained to moderately well drained silty clay loams. The soils are on recent or old natural levees. They have thin surface layers of silty clay loam. The subsoils are silty clay or silty clay loam and overlie coarser textured materials. Slopes range from 3 to 7 percent. The following soils are in this capability unit:

Commerce silty clay loam, gently sloping phase.
Dundee silty clay loam, gently sloping phase.

Surface runoff must be controlled on these soils. Some areas have already become moderately eroded. Permeability is moderately slow, and the capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility of these soils is moderate. The reaction ranges from medium acid to strongly acid in the Dundee soil. The Commerce soil is mildly alkaline.

These soils are well suited to most of the crops commonly grown in the area, but they are only fairly well suited to corn, lespedeza, and rice. Most of the perennial and summer grasses common to the area, as well as perennial and annual legumes, grow well on these soils.

The trees that grow well are sweetgum, red, water, and white oaks, and similar hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod; and (2) 1 year of a row crop followed by 2 years of oats and soybeans. The oats are seeded in fall and harvested in spring. Soybeans are seeded after the oats are harvested.

These soils have a tendency to become cloddy; they should not be worked when wet. Rows should be arranged so as to remove excess surface water without causing erosion. W-type ditches and, in some areas, vegetated waterways are needed for row outlets.

The content of organic matter can be increased by growing a suitable sod crop in the cropping sequence and by turning under crop residues. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 14 (IIIe-5)

The only soil in this capability unit is Forestdale silty clay loam, gently sloping phase. This somewhat poorly drained to poorly drained soil occurs in narrow strips on the old natural levees. It has slopes of 3 to 7 percent.

The subsoil is a thick silty clay that is underlain by coarser textured materials that occur at depths of about 24 inches. Surface runoff has caused some areas to be moderately eroded. Permeability is slow, and the capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility is moderate. This soil is medium to strongly acid. It is somewhat difficult to till, as it cracks when dry and is plastic when wet.

This soil is best suited to perennial crops, small grains, and legumes, but it is uncertain for row crops. It is fairly well suited to cotton and soybeans. Pasture plants to which the soil is well suited are bermudagrass, johnsongrass, and winter legumes. The soil is only fairly well suited to tall fescue, dallisgrass, white and red clovers, and the summer annual grasses.

Trees that grow well on this soil are sweetgum, red, water, and white oaks, and similar hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod, and (2) 1 year of cotton followed by 2 years of either soybeans or small grains and legumes.

Because of the moderately fine texture of the surface layer and the slow internal drainage, this soil has poor tilth. It should not be tilled when wet. Carefully laid out rows that empty into W-type ditches are needed. In some places vegetated outlets will be required to remove excess surface water. The areas of this soil are not uniform; therefore, it is difficult to arrange the rows so that mechanical equipment can be used efficiently. Deep plowing and the use of high seedbeds will help to drain and aerate the soil.

The content of organic matter can be increased by turning under crop residues, growing a suitable sod in the cropping sequence, and growing winter legumes after clean-tilled crops. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 15 (IIIe-6)

This capability unit consists of gently sloping, poorly drained, clayey soils. In most places these soils occupy long, narrow areas on the banks of old streams in slack-water areas. The slopes are 3 to 7 percent.

The surface layers are clay or silty clay in texture and are 2 to 4 inches thick. The subsoils consist of thick clay that restricts the movement of water and air and allows the roots of most plants to penetrate to only shallow depths. The following soils are in this capability unit:

Alligator clay, gently sloping phase.
Forestdale silty clay, gently sloping phase.
Sharkey silty clay, gently sloping phase.
Sharkey clay, gently sloping phase.
Sharkey-Clack soils, gently sloping phases.

These soils are difficult to manage. Surface runoff should be controlled. Permeability is very slow, and the capacity for holding available moisture is moderate to high. The content of organic matter is low, but the natural fertility is moderate. The soils range from strongly acid to neutral.

These soils are well suited to small grains, soybeans, bermudagrass, johnsongrass, dallisgrass, tall fescue, white and red clovers, vetch, and wild winter peas. They are fairly well suited to cotton, sudangrass, millet, and annual lespedeza.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod; and (2) 1 year of cotton, 2 years of soybeans, oats seeded in the fall of the third year, and fallow the fourth year after harvesting the oats.

These soils can be worked only within a narrow range of moisture content because they are plastic when wet and crack severely and become hard when dry. Deep plowing should be done in fall. Spring plowing leaves the soils cloddy, and they may remain cloddy throughout the growing season.

Rows should be arranged so as to remove excess surface water without causing erosion. The rows should empty into W-type ditches. In some places vegetated drainageways will be needed.

The content of organic matter can be increased by including a sod crop in the cropping sequence. In most places nitrogen is the only fertilizer needed. Alfalfa and some other legumes need lime.

CAPABILITY UNIT 16 (IIIs-1)

In this capability unit are gently sloping, slightly droughty soils that are on old or recent natural levees. The surface layers range from very fine sandy loam to sandy loam in texture. In most places they are at least 6 inches thick. The subsoils range from silty clay or sandy clay in the Dundee soils to loamy sand in the Clack and Crevasse soils. The slopes vary but range from 3 to 7 percent. The following soils are in this capability unit:

Beulah very fine sandy loam, gently sloping phase.
Dundee-Clack soils, gently sloping phases.
Robinsonville-Crevasse soils, gently sloping phases.

These soils are easy to work. Runoff must be controlled. Drainage ranges from somewhat poor to excessive. Permeability ranges from moderately slow to rapid, and the capacity for holding available moisture is low to moderate. The content of organic matter is low, and the natural fertility is low to moderate. The soils are medium acid to mildly alkaline.

These soils are best suited to early truck crops, but they are also suited to small grains and vetch grown for grazing. They are fairly well suited to cotton, early corn, and wild winter peas, but soybeans, late corn, sudangrass, and millet are uncertain crops.

Pasture plants to which the soils are suited are bermudagrass, johnsongrass, and crimson clover. The soils are not suited to dallisgrass, annual lespedeza, white and red clovers, and tall fescue.

Trees that grow well are ash, cottonwood, elm, hackberry, red, water, and white oaks, and sweetgum.

Suitable crop rotations are (1) 2 years of row crops and 4 years of grasses and legumes; and (2) 1 year of row crops, 1 year of oats or ryegrass with vetch left on the ground, and 1 year of volunteer vetch and native grasses.

These soils can be worked easily under a wide range of moisture conditions. Nevertheless, if they are left bare, they tend to crust and pack after rains. Spring is the best time to prepare them for planting.

Rows should be laid out carefully, generally on the contour. They should empty into W-type ditches or vegetated drainageways to provide for the greatest infiltration of water and to remove excess surface water. The variation in slope makes arrangement of the rows difficult in some areas.

The content of organic matter should be increased as much as feasible to improve structure, the rate of infiltration, and the capacity for holding available moisture, as well as to reduce crusting and packing. This can be done by using a suitable sod crop in the cropping sequence and by turning under crop residues. Most nonlegume crops respond to applications of nitrogen fertilizer.

CAPABILITY UNIT 17 (IIIs-2)

The only soil in this capability unit is Tunica silty clay, gently sloping phase. This soil is somewhat poorly drained. It generally occurs in long, fairly narrow strips on slopes of 3 to 7 percent.

The surface layer is a thin silty clay. The subsoil has a clay texture and overlies coarser textured materials that occur at depths of 14 to 24 inches. Surface runoff needs to be controlled. Permeability is slow, and the capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility of this soil is moderate. The soil is slightly acid to neutral.

This soil is suited to cotton, soybeans, small grains, vetch, and wild winter peas. It is fairly well suited to annual lespedeza, millet, and sudangrass. Corn and sorghum are uncertain crops.

Pasture crops to which the soil is suited are tall fescue, dallisgrass, bermudagrass, johnsongrass, alfalfa, and white and red clovers.

Sweetgum, water oak, hackberry, elm, and ash are the trees that grow best on this soil.

Suitable crop rotations are (1) 2 or 3 years of row crops followed by 4 to 6 years of sod, and (2) 1 year of row crops followed by 2 or 3 years of oats and vetch.

This soil is somewhat difficult to till, as it is very plastic when wet but very hard and severely cracked when dry. Deep plowing late in fall or early in winter is desirable. If the soil is not prepared until just before planting in the spring, it becomes cloddy and remains so throughout the growing season. This sometimes causes the stands of crops to be poor.

Seedbeds built up high help to drain and aerate this soil. Rows arranged generally on the contour and W-type ditches and vegetated outlets will help to remove excess surface water.

The content of organic matter can be increased by turning under crop residues and by using a sod in the cropping sequence. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 18 (IIIs-4)

This capability unit consists of nearly level, clayey soils that are poorly drained. The soils occur in small to large areas on slopes of ½ to 3 percent. They are mostly in slack-water areas.

The surface layers are clay or silty clay, 2 to 5 inches thick. The subsoils are thick and consist of clay that restricts the movement of water and air and allows the roots of most plants to penetrate to only shallow depths. The following soils are in this capability unit:

Alligator clay, nearly level phase.
Alligator silty clay, nearly level phase.
Forestdale silty clay, nearly level phase.
Mhoon silty clay, nearly level phase.
Sharkey clay, nearly level phase.
Sharkey silty clay, nearly level phase.
Sharkey-Clack soils, nearly level phases.

These soils are difficult to manage. Good stands of crops are difficult to obtain, because the soils swell and seal over when wet and become hard and crack severely when dry. Surface runoff is slow to moderately slow. As a result, excess water remains on the surface of the more nearly level areas after heavy rains. Permeability is very slow, and the capacity for holding available moisture is generally high. In many places the water table is near the surface during prolonged wet periods. The content of organic matter is fairly high when the soils are first cleared, but it decreases rapidly under tillage. The natural fertility of these soils is moderate to high. The soils are strongly acid to mildly alkaline.

These soils are suited to small grains, rice, soybeans, vetch, and wild winter peas. They are fairly well suited to cotton, sudangrass, millet, and annual lespedeza, but corn is an uncertain crop. Pasture plants to which these soils are suited are bermudagrass, dallisgrass, johnsongrass, tall fescue, and white and red clovers. Trees that grow well are sweetgum and water oak.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod (fig. 5); (2) 1 year of cotton and 2 years of small grains or soybeans; (3) 2 or 3 years of rice and 3 years of pasture, of small grains and vetch, or of soybeans; and (4) 1 year of cotton followed by 2 years of winter legumes grown for seed.

These soils can be worked only within a narrow range of moisture content, because they are plastic when wet and crack severely and are too hard when dry. Deep plowing should be done in fall. Spring plowing leaves the soils

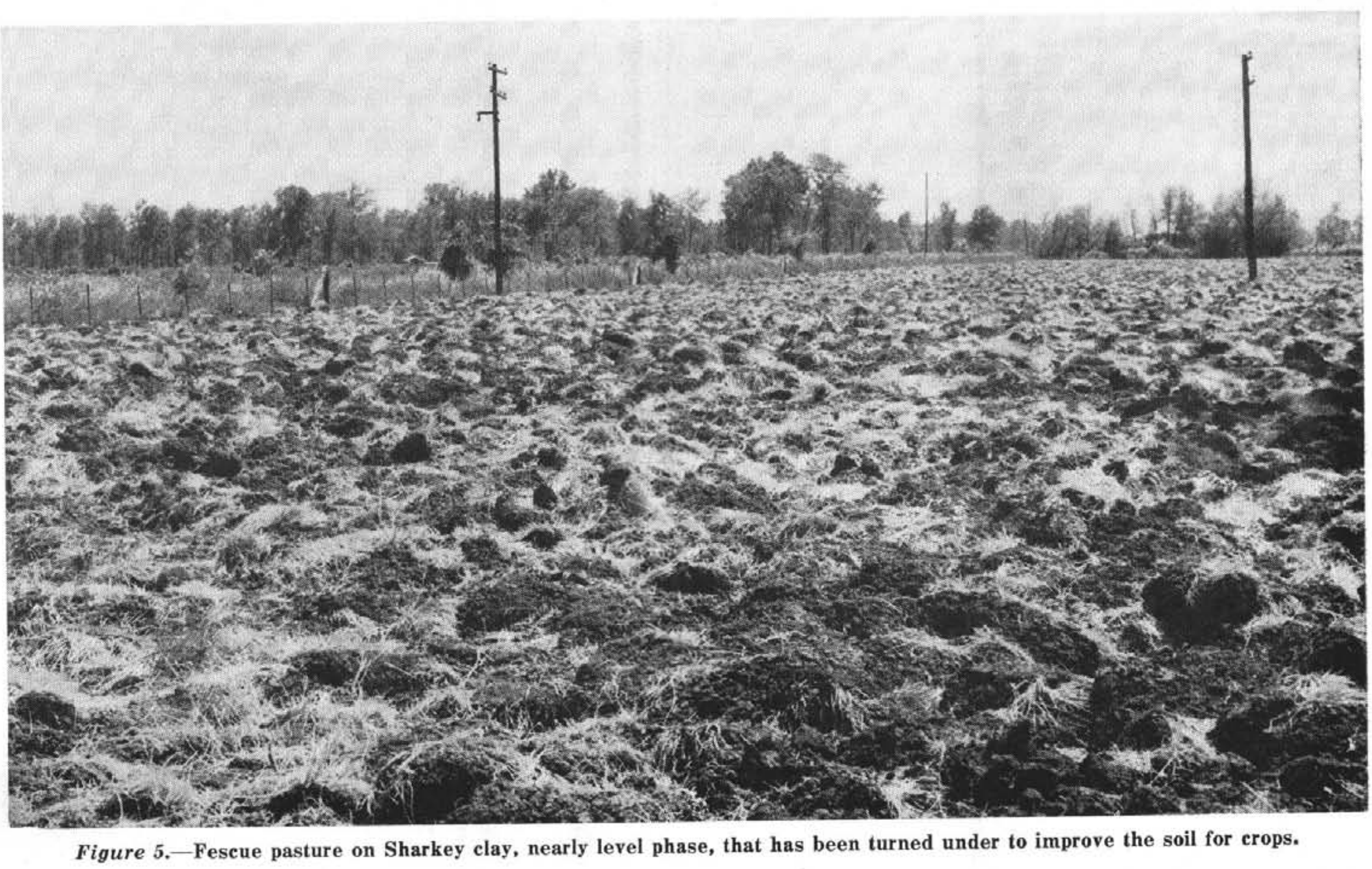

Figure 5.—**Fescue pasture on Sharkey clay, nearly level phase, that has been turned under to improve the soil for crops.**

cloddy, and they may remain cloddy throughout the growing season.

Rows should be arranged so as to give the maximum amount of drainage with the least amount of erosion. Many V-type and W-type ditches are needed to remove the excess surface water.

The content of organic matter can be increased by using a suitable sod in the cropping sequence. In most places nitrogen is the only fertilizer needed. Alfalfa and some other legume crops need lime.

CAPABILITY UNIT 19 (IIIw-1)

The only soil in this capability unit is Commerce silty clay, level phase. This soil is somewhat poorly drained to moderately well drained. In many places it is transitional between soils of the recent natural levees and soils of the slack-water areas.

The surface layer and the subsoil are fine textured. They overlie coarser textured material that occurs at shallow depths. Slopes are less than ½ percent. Surface runoff and permeability are both slow, and the capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility of the soil is moderate. The reaction is neutral to mildly alkaline.

This soil is suited to cotton, sorghum, soybeans, small grains, rice, vetch, and wild winter peas. It is fairly well suited to corn, annual lespedeza, millet, and sudangrass. Pasture plants to which the soil is suited are tall fescue, johnsongrass, dallisgrass, white and red clovers, and winter legumes. The soil is only fairly well suited to annual summer grasses and annual lespedeza.

Trees that grow best on this soil are sweetgum, water oak, and similar hardwoods.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod; (2) 2 years of nonlegume row crops, soybeans the third year followed by oats and red clover planted in the fall, and fallow the rest of the fourth year after oats are harvested in the spring; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

This soil is somewhat difficult to cultivate. It is very plastic when wet, and, when dry, it is very hard and has many cracks. Deep plowing should be done late in fall or early in winter. Plowing the soil near planting time in spring causes it to become cloddy. It may remain cloddy throughout the growing season. This cloddiness often causes the stands of crops to be poor. Seedbeds built high will improve drainage without causing erosion. V-type and W-type ditches are needed to provide outlets for surface water.

The content of organic matter can be increased by turning under crop residues and by using sod in the cropping sequence. In most places nitrogen is the only fertilizer needed.

CAPABILITY UNIT 20 (IIIw-3)

The only soil in this capability unit is Forestdale silt loam, level phase. This soil is somewhat poorly drained to poorly drained.

The surface layer is a silt loam that is generally at least 5 inches thick. The subsoil is a thick layer of silty clay underlain by coarser textured materials that occur at depths of about 24 to 27 inches. Slopes are less than ½ percent. Surface runoff and permeability are both slow. The capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility is moderate. The soil is medium to strongly acid.

This soil is easy to till. It is well suited to soybeans, sorghum, small grains, vetch, and wild winter peas and is fairly well suited to cotton, rice, sudangrass, and millet.

Pasture plants to which the soil is well suited are bermudagrass, johnsongrass, and winter legumes. The soil is only fairly well suited to dallisgrass, tall fescue, white and red clovers, and annual lespedeza and other summer annuals. Trees that grow well on this soil are hackberry, elm, ash, overcup oak, and bitter pecan.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod; and (2) 2 years of nonlegume row crops followed by soybeans the third and fourth years; oats and winter legumes are seeded in the fall of the fourth year; the oats are harvested in the spring of the fifth year, and the soil is fallowed the remainder of the year.

This soil is easy to till, but if it is left bare, rains will cause it to pack, crust, and puddle. The crusts are so hard in places that stands of crops are poor. Tillage may be delayed for several days after rains because surface runoff and internal drainage are slow. A hard, compact layer, or plowpan, 2 to 14 inches thick, tends to form just below the plow layer. The plowpan should be shattered by deep plowing during the dry months late in fall. It is best to prepare the soil for spring crops early in spring, however, rather than in fall.

Rows should be arranged so as to give the maximum amount of surface drainage without causing erosion. V-type and W-type ditches are needed to remove excess surface water.

The content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Nonlegume crops will respond to nitrogen fertilizer. In most places the acidity of the soil must be corrected if the best yields of alfalfa are to be obtained.

CAPABILITY UNIT 21 (IIIw-5)

The only soil in this group—Forestdale silty clay loam, level phase—is somewhat poorly drained to poorly drained. It is on slopes of less than ½ percent. This soil is transitional between the soil of the old natural levees and the soils of the slack-water areas.

The surface layer is at least 4 inches thick in most places. The subsoil is a thick layer of silty clay that is underlain by coarse-textured materials, which occur at depths of about 24 to 28 inches. Surface runoff and permeability are both slow, but the capacity for holding available moisture is high to very high. The content of organic matter is low, and the natural fertility of this soil is moderate. The soil is medium to strongly acid.

This soil is well suited to soybeans, rice, small grains, vetch, wild winter peas, and sorghum. Cotton, corn, and alfalfa are uncertain crops.

Pasture crops to which the soil is well suited are bermudagrass, johnsongrass, and winter legumes. The soil is only fairly well suited to tall fescue, dallisgrass, white and red clovers, sudangrass, millet, and the summer grasses.

Trees that grow well on this soil are sweetgum and red, water, and white oaks.

Suitable crop rotations are (1) 2 years of row crops followed by 3 years of sod crops; (2) 2 years of cotton and 2 years of soybeans; oats are seeded in the fall of the fourth year, and the soil is fallowed the remainder of the fifth year after the oats have been harvested in spring; and (3) 1 year of cotton followed by 2 years of winter legumes grown for seed.

This soil is difficult to till; it is plastic when wet and is very hard and has numerous cracks when dry. Deep plowing and the use of high seedbeds will improve drainage and aeration. Rows should be laid out so as to give maximum drainage without causing erosion. A system of V-type and W-type ditches is also needed to remove the excess water that tends to pond on the surface.

The content of organic matter can be increased by turning under crop residues and by using sod in the cropping sequence. In most places nitrogen is the only fertilizer needed. Some legume crops may require lime.

CAPABILITY UNIT 22 (IIIw-11)

This capability unit is made up of level, poorly drained, clayey soils. The soils occur in broad slack-water areas and have slopes of 0 to ½ percent. The surface layers are clay or silty clay, 2 to 4 inches thick. The subsoils are a thick layer of clay that restricts the movement of water and air and allows the roots of most plants to penetrate to only shallow depths. The following soils are in this capability unit:

Alligator clay, level phase.
Alligator silty clay, level phase.
Forestdale silty clay, level phase.
Sharkey clay, level phase.
Sharkey silty clay, level phase.

These soils are difficult to work. Surface runoff is slow and permeability is very slow. The water table may be near the surface during wet seasons. The capacity for holding available moisture is high. The content of organic matter is low, and the natural fertility is moderate to high. The soils are strongly acid to slightly acid.

These soils are limited by excess moisture, poor tilth, and the hazard of local floods. They are best suited to rice, soybeans, and sorghum. Unless they are drained extensively, they are not suited to small grains, vetch, wild winter peas, and cotton. Corn does not grow well.

Pasture plants to which the soils are well suited are bermudagrass, dallisgrass, johnsongrass, tall fescue, and whiteclover. The soils are only fairly well suited to sudangrass, millet, red clover, and annual lespedeza. Forest trees that grow well are ash, elm, hackberry, sweetgum, and water oak.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops; (2) 2 or 3 years of rice followed by 3 years of pasture, small grains, or soybeans; (3) 1 year of nonlegume row crops followed by 2 years of summer legumes; and (4) 1 year of nonlegume row crops followed by 2 years of winter legumes grown for seed.

Good stands of crops are difficult to obtain because the soils swell, seal over, and puddle when wet, and they crack severely and are very hard when dry. Most of the time they are either too wet or too dry to cultivate. Plowing should be done in fall because spring breaking leaves the soils cloddy, and they may remain cloddy throughout the growing season. Surface drainage is a problem, because surface runoff is slow and runoff water from adjacent higher lying soils collects and ponds on the soils. Rows should be laid out so as to give the maximum amount of surface drainage with the least erosion. Many V-type and W-type ditches will be needed to help remove the excess surface water.

The content of organic matter can be increased by using a suitable sod in the cropping sequence. In most places nitrogen is the only fertilizer needed. Alfalfa and some other legumes need lime.

CAPABILITY UNIT 23 (IIIw-13)

In this capability unit there are several soils of the Dowling series that were mapped together as Dowling soils. These poorly drained soils occur in long, narrow, level or nearly level depressions. Additional soil material is received periodically from the surrounding higher lying soils. The texture of the surface layers varies but ranges from silty clay to very fine sandy loam. The subsoils are clay that contains lenses of coarser materials in places.

Surface runoff is very slow to ponded, and permeability is very slow. The water table is at the surface during wet seasons, and the capacity for holding available moisture is high. The content of organic matter is higher than in the surrounding soils, and the natural fertility of these soils is moderate to high. The soils are medium acid to neutral.

The low position, local flooding, poor drainage, and poor tilth limit the use of these soils. The soils are suited to rice and sorghum but are only fairly well suited to soybeans, corn, wheat, vetch, and wild winter peas. The principal crops are cotton and soybeans, but it is hazardous to grow small grains and cotton and similar row crops because of the frequent floods.

Pasture plants to which the soils are fairly well suited are tall fescue, bermudagrass, dallisgrass, sudangrass, white clover, and millet. Johnsongrass and red clover do not grow well.

Trees that grow well on these soils are ash, elm, bitter pecan, sweetgum, and overcup and water oaks. Blackberries also grow well.

Suitable crop rotations are (1) 2 years of row crops followed by 4 years of sod crops, and (2) permanent meadow.

Tilth is poor. The soils are difficult to manage, and they remain wet for long periods after heavy rains. Dragline and V-type and W-type ditches are needed to remove the excess water. If the soils are cropped, the rows should be laid out so as to give the maximum surface drainage.

Nitrogen is the only fertilizer needed. Too much nitrogen, however, can cause plants to make excessive growth.

CAPABILITY UNIT 24 (IVe-3)

In this capability unit is one soil complex—Dundee-Clack soils, sloping phases—which consists of sloping, slightly droughty, loamy soils. These soils occur on irregular slopes of 7 to 10 percent. The surface layers vary in texture and thickness. The subsoils range from silty clay to loamy sand in texture.

Drainage ranges from somewhat poor to excessive. Surface runoff has caused some areas to be moderately eroded. Permeability ranges from moderately slow to rapid, and the capacity for holding available moisture is low to moderate. The content of organic matter is low. The natural fertility of these soils is low to moderate. The soils range from medium acid to strongly acid.

These soils are not well suited to row crops, but cotton or corn may be grown occasionally. The pasture crops to which the soils are best suited are bermudagrass, johnsongrass, small grains, vetch, wild winter peas, and crimson clover. The soils are not well suited to dallisgrass, annual lespedeza, and white and red clovers. Pastures on these soils are best early in spring when moisture is abundant. White and red oaks and similar hardwoods grow well.

A suitable cropping sequence is 1 year of row crops followed by 5 or 6 years of a grass-legume sod.

These soils are easy to work and can be worked within a wide range of moisture conditions; nevertheless, rain causes them to crust and erode if they are left bare. These soils should be prepared for planting in spring.

Row arrangement, with V-type and W-type ditches as outlets, is needed to conserve water and to remove excess water.

The content of organic matter can be increased by turning under crop residues, by using a suitable sod in the cropping system, and by growing winter legumes after clean-tilled crops. Most nonlegume crops respond to nitrogen fertilizer.

CAPABILITY UNIT 25 (IVw-1)

The only soil in this capability unit, Dowling clay, is poorly drained. It occurs in numerous narrow to broad, level depressions throughout the slack-water areas. Both the surface soil and subsoil are a very plastic, very sticky clay. Runoff from the nearby higher lying soils accumulates in these low areas and deposits additional soil material periodically. Permeability is very slow, and the water table is at the surface during wet seasons. The capacity for holding available moisture is high. This soil contains more organic matter than the surrounding soils, and the natural fertility is moderate to high. The soil is medium acid to neutral.

This soil is fairly well suited to hay and pasture, but row crops are uncertain. It is well suited to rice but is only fairly well suited to sorghum, soybeans, millet, and sudangrass.

Pasture crops to which the soil is fairly well suited are tall fescue, bermudagrass, dallisgrass, and white clover. The soil is not suited to johnsongrass and red clover.

Trees that grow well are bitter pecan, cottonwood, cypress, tupelo-gum, willow, and overcup oak.

Suitable crop rotations are (1) 2 years of rice followed by 2 years of soybeans; (2) summer annuals; and (3) 2 years of summer annuals or soybeans followed by 4 years of sod crops.

Tilth is poor, and the soil is difficult to manage. Excess surface water often delays the planting and cultivating of row crops. When the soil is dry, it shrinks and cracks so that the roots of some plants are injured. Extensive surface drainage is needed for most crops. This can be provided through dragline and V-type and W-type ditches. If the soil is cropped, the rows should be laid out so as to give maximum surface drainage.

Although this soil is fairly fertile, its low position, poor drainage, and fine texture prevent plants from using fertilizers efficiently.

CAPABILITY UNIT 26 (VIIs-1)

This capability unit consists of nearly level, droughty soils that are on natural levees. The soils have a thick surface layer that ranges in texture from very fine sandy loam to sandy loam. The subsoils range in texture from light sandy clay loam to loamy sand. Slopes are ½ to 3 percent. The following soils are in this capability unit:

Clack-Bosket soils, nearly level phases.
Crevasse soils, nearly level phases.

Surface runoff is not a problem on these soils, but most of the soils have excessive drainage. Permeability is moderately rapid to rapid, and the capacity for holding available moisture is low. The content of organic matter is low, and the soils are low in natural fertility. The soils are strongly acid to mildly alkaline. Their droughtiness greatly limits their use.

The soils in this group are easy to work, but they are not suited to row crops. The pasture plant to which they are best suited is bermudagrass. The soils are not well suited to trees, but cottonwoods, black willows, and sycamores of poor quality will grow.

A suitable cropping sequence is bermudagrass overseeded with crimson clover, oats, or vetch. Fertilizers leach out of the soils very rapidly.

Estimated Yields

In table 1 are given the estimated average acre yields of the principal crops grown on each of the soils of Coahoma County under two levels of management. In columns A are average yields under management now prevalent in Coahoma County. In columns B are yields based on management that includes the choice of suitable crops and varieties, the proper use of commercial fertilizers, control of insects, proper tillage, and adequate drainage. The practices used to obtain yields in columns B did not include irrigation.

The estimates shown are based mainly on information obtained from experimental data and from farmers and other agricultural workers who were in a position to observe soils and crop yields in this county and in neighboring counties.

Woodlands

Areas of woodland occupy approximately 89,447 acres in Coahoma County. The tracts range in size from a few acres to several thousand acres. Some of the larger areas, totaling approximately 48,000 acres, lie between the Mississippi River and its levees. The forests in some of these areas are well managed; from these, lumber and other wood products of good quality are obtained. The forests in other areas have been mismanaged so that only cull trees remain.

In Coahoma County, hardwoods grow in many of the areas between the Mississippi River and its levees. If well managed, these provide a good source of income.

Practices for managing areas of hardwoods consist of (1) preventing fires in these areas; (2) prohibiting stock from grazing in woodlands where young trees are needed to stock the areas; (3) harvesting badly damaged and overmature trees; and (4) killing privet, red haw, other large shrubs, and the culls of commercial species. Additional suggestions for managing the areas of hardwoods can be obtained by consulting the local State Forestry representative.

TABLE 1.—*Estimated average acre yields of principal crops under two levels of management*

[Yields in columns A are those to be expected over a period of years under common management practices; those in columns B, under good management practices. Absence of yield indicates crop is not commonly grown under the management specified]

Soil	Cotton		Corn		Soybeans		Oats		Rice		Permanent pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Acres per animal unit* [1]	*Acres per animal unit* [1]
Alligator clay:												
Level phase	200	300	15	25	12	30	------	------	40	70	------	4.0
Nearly level phase	250	400	20	45	12	30	30	50	40	70	6.0	3.0
Gently sloping phase	250	400	20	45	12	30	30	50	------	------	5.5	3.5
Alligator silty clay:												
Level phase	200	300	15	25	12	30	------	------	40	70	------	4.0
Nearly level phase	250	400	20	45	12	30	30	50	40	70	6.0	3.0
Alluvial soils	------	------	------	------	------	------	------	------	------	------	------	------
Beulah silty clay loam, nearly level overwash phase	375	500	30	60	10	15	30	50	------	------	5.0	2.5
Beulah very fine sandy loam:												
Nearly level phase	375	500	30	60	10	15	30	50	------	------	5.0	2.5
Gently sloping phase	325	450	20	40	10	15	30	50	------	------	5.0	2.5
Bosket very fine sandy loam:												
Nearly level phase	625	750	40	75	10	15	30	50	------	------	5.0	2.5
Gently sloping phase	450	550	30	60	10	15	30	50	------	------	5.0	2.5
Clack-Bosket soils, nearly level phases	------	------	------	------	------	------	------	------	------	------	25.0	15.0
Commerce silt loam:												
Nearly level phase	700	825	50	85	20	35	35	55	------	------	4.2	2.2
Gently sloping phase	700	825	50	85	20	35	35	55	------	------	4.2	2.2
Commerce silty clay:												
Level phase	450	550	35	50	20	35	------	------	------	------	------	4.0
Nearly level phase	450	550	35	50	20	35	------	------	------	------	6.0	3.0
Commerce silty clay loam:												
Nearly level phase	525	625	45	65	20	35	35	55	------	------	4.5	2.5
Gently sloping phase	475	575	40	60	15	30	35	55	------	------	5.5	3.5
Crevasse soils, nearly level phases	------	------	------	------	------	------	------	------	------	------	25.0	15.0
Dowling clay	------	------	------	------	15	40	------	------	30	70	6.0	4.0
Dowling soils	200	300	15	35	15	40	------	------	35	70	5.0	2.3
Dubbs silt loam, nearly level phase	625	800	40	85	15	25	35	55	------	------	4.2	2.2
Dubbs very fine sandy loam:												
Nearly level phase	625	800	40	85	15	25	35	55	------	------	4.2	2.2
Gently sloping phase	525	700	35	60	10	15	35	55	------	------	4.2	2.4
Dundee silt loam:												
Nearly level phase	625	750	40	85	15	25	35	55	------	------	4.2	2.2
Gently sloping phase	525	650	35	60	10	15	35	55	------	------	4.2	2.4
Dundee silty clay loam:												
Level phase	425	600	35	50	15	25	------	------	------	------	------	3.0
Nearly level phase	475	625	35	50	15	25	35	55	------	------	4.5	2.5
Gently sloping phase	400	500	25	45	15	20	35	55	------	------	5.5	3.5
Dundee very fine sandy loam:												
Nearly level phase	625	750	40	85	15	25	35	55	------	------	4.2	2.2
Gently sloping phase	525	650	35	60	10	15	35	55	------	------	4.2	2.4
Dundee-Clack soils:												
Nearly level phases	525	650	30	60	10	20	35	55	------	------	4.0	2.5
Gently sloping phases	475	600	20	55	10	15	35	55	------	------	4.5	3.5
Sloping phases	325	425	20	35	------	------	30	50	------	------	5.0	4.0
Forestdale silt loam:												
Level phase	325	450	25	50	15	25	------	------	------	------	3.0	5.0
Nearly level phase	375	500	35	55	15	25	30	50	40	70	4.2	2.2
Forestdale silty clay:												
Level phase	200	300	15	25	12	30	------	------	40	70	------	4.0
Nearly level phase	250	400	20	45	12	30	30	50	40	70	6.0	3.0
Gently sloping phase	250	400	20	45	12	30	30	50	------	------	5.5	3.5
Forestdale silty clay loam:												
Level phase	250	325	20	30	15	30	------	------	40	70	5.5	3.5
Nearly level phase	350	450	25	50	15	30	30	50	40	70	5.5	2.8
Gently sloping phase	325	400	25	40	15	25	30	50	------	------	5.5	2.8
Mhoon silty clay, nearly level phase	300	400	30	50	15	30	30	50	40	70	6.0	3.0
Robinsonville very fine sandy loam:												
Nearly level phase	700	825	50	85	15	25	35	55	------	------	5.0	2.5
Gently sloping phase	625	750	40	70	15	20	35	55	------	------	5.0	2.5

See footnote at end of table.

TABLE 1.—*Estimated average acre yields of principal crops under two levels of management*—Continued

[Yields in columns A are those to be expected over a period of years under common management practices; those in columns B, under good management practices. Absence of yield indicates crop is not commonly grown under the management specified]

Soil	Cotton		Corn		Soybeans		Oats		Rice		Permanent pasture	
	A	B	A	B	A	B	A	B	A	B	A	B
	Lb.	*Lb.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Acres per animal unit* [1]	*Acres per animal unit* [1]
Robinsonville-Crevasse soils:												
Nearly level phases	375	500	30	60	10	15	30	50	------	------	5. 5	3. 0
Gently sloping phases	325	450	20	40	10	15	30	50	------	------	5. 5	3. 0
Sharkey clay:												
Level phase	200	300	25	45	15	30	------	------	40	70	------	4. 0
Nearly level phase	300	400	30	50	15	30	30	50	40	70	6. 0	3. 0
Nearly level phase, shallow over sand	350	450	20	40	10	25	30	50	------	------	6. 0	3. 0
Gently sloping phase	300	400	30	50	15	30	30	50	------	------	6. 0	3. 0
Sharkey silty clay:												
Level phase	200	300	25	45	15	30	------	------	40	70	------	4. 0
Nearly level phase	300	400	30	50	15	30	30	50	40	70	6. 0	3. 0
Gently sloping phase	300	400	30	50	15	30	30	50	------	------	6. 0	3. 0
Sharkey silt loam, nearly level overwash phase	375	500	35	55	15	25	30	50	40	70	5. 5	2. 8
Sharkey-Clack soils:												
Nearly level phases	275	375	------	------	10	25	30	50	------	------	3. 0	6. 0
Gently sloping phases	275	375	------	------	10	20	30	50	------	------	3. 0	6. 0
Souva silt loam	350	500	45	85	15	25	------	------	------	------	5. 0	2. 3
Tunica silty clay:												
Nearly level phase	450	625	30	45	15	30	30	55	------	------	5. 0	3. 0
Gently sloping phase	450	625	30	45	15	30	30	55	------	------	6. 0	3. 0

[1] Average number of acres required to furnish, without injury to the pasture, adequate grazing for 1 animal unit for a grazing period of 221 days. An animal unit is equivalent to 1 cow, steer, or horse; 5 hogs; or 7 sheep or goats.

The following information, relative to the uses of the soils, applies to this county. It was taken from an article, Land Use Planning in the Mississippi Delta, by J. S. Knight of the United States Forest Service.

In the Delta area there has been a trend toward converting additional land to use for general farming. Some areas have been cleared for use for general farming that would have had more value if used as well-managed woodland. Except for the areas that are flooded frequently, practically all of the soils, if they were drained adequately, could be used for crops or pasture. The acreage in class VII soils is comparatively small.

At present, the decision to use the soils for crops, pasture, or forest is based largely on the needs of the owner and on the type of management he is practicing. Because clearing and developing is costly, the owner should develop fully land that has already been cleared before he clears additional areas. He should also determine the value of the trees that are on the land, both in terms of products that can be sold immediately and as an investment after the trees mature. More income can be derived from some areas if they are used to grow trees than if they are used for row crops or pasture. When a wooded area is cleared, an investment in timber is destroyed; even a poor stand, if well managed, will soon become a source of pulpwood.

Areas used for timber should be managed according to the size of the farm. Large farms or plantations more than 200 acres in size are more suitable for growing timber than smaller areas. This is because the large areas can remain in trees without limiting the income from crops. Also, workers who are already on the farm can be used in the wooded areas. The trees are generally sold standing, however, because they can be logged more economically by professional lumbermen.

On small farms the size of the areas used as woodland depends generally on the need for forest products and on the need for shade for livestock, as well as on how much acreage is unsuitable for cropping. Also, the number of years between sales and the labor and equipment required must be considered. Nevertheless, with good management, areas of woodland should be profitable on any farm.

Well-managed woodland yields an average of 2 to 8 dollars per acre each year depending on the location. It also has value for use for recreational purposes and as game preserves.

Wildlife

In Coahoma County lakes, swamps, and bayous occupy approximately 14,000 acres. These, with the areas of woodland, provide food and shelter for wildlife. The management of wildlife has two broad phases—(1) management of wildlife in large, forested areas such as lie between the river and its levees, and (2) management of wildlife as part of a well-balanced farm program.

Between the river and its levees are large tracts of hardwoods in which deer and turkeys are fairly plentiful. These areas can be improved for wildlife by making small clearings to be seeded for winter grazing for deer and turkeys. The swamps, streams, and lakes offer shelter for waterfowl. Many farmers supplement the natural supply of food in these areas by flooding the ricefields and oak flats late in fall and in winter.

Figure 6.—**Bayous that have a good cover of plants along the banks are excellent for fish, waterfowl, and small animals. The soils on both sides of the bayou are in class I.**

Hedgerows and the vegetation on the banks of bayous provide good cover for quail (fig. 6). If small areas, near cover, on the banks of the bayous are seeded to plants that will provide food for quail, the quail population will generally increase.

Management of the waters for game fishing consists largely of regulating the water level and of controlling the population of rough fish. Little management of this type has been practiced in the county, although many rough fish are taken by commercial fishermen each year.

Engineering Properties of Soils

This soil survey report for Coahoma County, Miss., contains information that can be used by engineers to—

1. Make soil and land use studies that will aid in selecting and developing industrial, business, residential, and recreational sites.
2. Assist in designing drainage and irrigation structures and in planning dams and other structures for water and soil conservation.
3. Make preliminary evaluations of soil and ground conditions that will aid in selecting highway and airport locations and in planning detailed soil surveys for the intended locations.
4. Locate sand and gravel for use in structures.
5. Correlate performance of engineering structures with types of soil and thus develop information that will be useful in designing and maintaining the structures.
6. Determine the suitability of soil units for cross-county movements of vehicles and construction equipment.
7. Supplement information obtained from other published maps and reports and aerial photographs, for the purpose of making soil maps and reports that can be used readily by engineers.

The mapping and the descriptive report are somewhat generalized and should be used only in planning more detailed field surveys that will, in turn, be used to determine the in-place condition of the soil at the site of the proposed engineering construction.

The engineering interpretations made in this section were based partly on samples taken from 5 profiles, and tested in the Soils Laboratory, Bureau of Public Roads (see table 2). Three of the sampling sites were in nearby Humphreys County, and two were in Leflore County. The four soil types sampled are extensive in Coahoma County. The samples were tested for moisture density, particle-size distribution, liquid limit, and plasticity index. According to results of the tests, the soils were assigned ratings in the classification systems of the American Association of State Highway Officials (*1*)[2] and the Unified system (*15*). In the testing, the percentage of clay was obtained by the hydrometer method and, therefore, is not suitable as a basis for naming textural classes of soils.

Because samples were taken from only five profiles, it was necessary to estimate the A. A. S. H. O. and Unified engineering classification for the rest of the soils mapped, and to estimate permeability, available moisture-holding capacity, shrink-swell potential, and suitability as a source of topping material. These estimates are shown in table 3.

Tables 4 and 5, respectively, are provided for those not familiar with the soil properties considered in arriving at the A. A. S. H. O. and Unified classifications. In the second column of table 5, the symbols used in the Unified system are listed, and in the last column of the table, the equivalent symbols used in the A. A. S. H. O. classification.

Because the classifications and terms used in this section may not be familiar to farmers and others interested in construction, definitions are given in the following paragraphs. Engineers can refer to the glossary for definitions used in soil surveying.

[2] Italic numbers in parentheses refer to Literature Cited, p. 56.

Classification Systems

A. A. S. H. O. classification.—The American Association of State Highway Officials has developed a classification based on the field performance of soils. In this classification soils are placed in seven groups, designated A–1, A–2, A–3, A–4, A–5, A–6, and A–7. Some of the groups are divided into subgroups. The soils in each group are valued by means of a group index, a number that takes into account the behavior of soil and soil materials in embankments, subgrades, and subbases. The essentials of the classification are shown in table 4, which also describes, for each class, the nature and the stability of the material. Most highway engineers classify soil in accordance with this system.

TABLE 2.—*Engineering test data* [1] *for soil*

Soil name and location	Parent material	Bureau of Public Roads report number	Depth	Horizon
Alligator clay:			*Inches*	
Center SW¼ sec. 33, T. 16 N., R. 4 W.[5]	Alluvium	93211	0 to 3	A_p
		93212	3 to 30	
		93213	30 to 55	
Dundee silty clay loam:				
SW¼ sec. 3, T. 20 N., R. 1 W.[6]	Old alluvium on Mississippi River flood plains.	92903	0 to 5	A_p
		92904	5 to 18	B_{21} and B_{22}
		92905	18 to 48	B_3 and C
Dundee very fine sandy loam:				
NE¼NW¼ sec. 8, T. 15 N., R. 2 W.[5]	Old alluvium on Mississippi River flood plains.	93217	0 to 6	A_p
		93218	6 to 24	B_2
		93219	24 to 38	
		93220	38 to 56	
Forestdale silty clay loam:				
NW¼NW¼ sec. 2, T. 16 N., R. 5 W.[5]	Old alluvium on Mississippi River flood plains.	93214	0 to 4	A_p
		93215	4 to 26	B_2
		93216	26 to 53	
NE¼SW¼ sec. 7, T. 19 N., R. 1 W.[6]	Old alluvium on Mississippi River flood plains.	92900	0 to 9	A_p and A_2
		92901	9 to 27	B_{21g} and B_{22}
		92902	27 to 59	C_{1g} and C_{2g}

[1] Tests performed by Bureau of Public Roads in accordance with standard procedures of the American Association of State Highway Officials (A. A. S. H. O.) (*1*).

[2] Mechanical analyses according to the A. A. S. H. O. Designation, T. 88. Results by this procedure frequently differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the A. A. S. H. O. procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 mm. in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette

Unified soil classification system.—In this classification system soil materials are identified as coarse grained (8 classes), fine grained (6 classes), or highly organic. The principal characteristics of these 15 classes of soil are given in table 5. The classification of the tested soils according to the Unified system is given in the last column of table 2.

Definitions of Terms

Liquid limit.—The moisture content at which the soil material passes from a plastic to a liquid state.

Maximum dry density.—The highest dry density obtained in the compaction test.

Mechanical analysis.—Gradation or grain-size analysis, showing the composition of the material by particle sizes, usually expressed in percentage of the total weight of all grains smaller than certain diameters. Table 2 gives the mechanical analyses of samples taken from five soil profiles. The analyses were made by sieve and hydrometer methods. The names used by engineers for the various sizes of particles of sand, silt, and clay are not the same as those used by soil scientists. For example, *fine sand*, in engineering terminology, consists of particles 0.42 to 0.074 millimeter in diameter, whereas *fine sand*, as defined by the soil scientists, consists of particles 0.25 to 0.10 millimeter in diameter. The mechanical analyses used in table 2 are not suitable for use in naming textural classes of soils.

Moisture density.—If a soil material is compacted at successively higher moisture contents, assuming that the compactive effort remains constant, the density of the compacted material will increase until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed maximum dry density. Data showing moisture density are important in earthwork, for as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

Plastic limit.—The moisture content at which the soil material passes from a solid to a plastic state.

Plasticity index.—The numerical difference between the liquid limit and the plastic limit. The plasticity index indicates the range of moisture content within which a soil material is plastic.

samples taken from 5 soil profiles

Moisture density		Mechanical analysis [2]						Liquid limit	Plasticity index	Classification	
		Percentage passing sieve		Percentage smaller than—							
Maximum dry density	Optimum moisture content	No. 60 (0.25 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.			A. A. S. H. O. [3]	Unified [4]
Lb. per cu. ft.	*Percent*										
91	23	100	99	91	76	63	52	71	40	A-7-5 (20)	CH
92	25	100	99	88	75	65	54	85	54	A-7-5 (20)	CH
93	25	100	99	85	69	61	50	94	64	A-7-5 (20)	CH
104	17	100	97	85	60	29	21	34	11	A-6 (8)	ML-CL
103	19	100	98	83	57	37	32	48	24	A-7-6 (15)	CL
108	17	100	97	80	48	24	20	35	13	A-6 (9)	ML-CL
100	17	100	91	60	26	10	7	23	0	A-4 (8)	ML
104	18	100	96	82	56	37	31	42	20	A-7-6 (12)	CL
106	18	100	97	78	48	26	23	37	14	A-6 (10)	ML-CL
108	17	100	98	80	48	23	18	34	9	A-4 (8)	ML-CL
108	16	100	93	78	55	35	28	33	13	A-6 (9)	CL
100	22	100	97	86	68	50	45	63	38	A-7-6 (20)	CH
105	17	99	91	74	50	35	31	47	24	A-7-6 (15)	CL
108	17	100	93	77	50	29	24	31	11	A-6 (8)	CL
99	21	100	98	85	60	39	35	50	25	A-7-6 (16)	CH
108	17	100	97	80	52	30	25	39	17	A-6 (11)	CL

method, and the material coarser than 2 mm. in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soils.

[3] Based on the Classification of Soils and Soil-Aggregate Mixtures for Highway Purposes, A. A. S. H. O. Designation: M 145-49.

[4] Based on the Unified Soil Classification System, Tech. Memo. No. 3-357, v. 1, Waterways Experiment Station, Corps of Engineers, March 1953.

[5] Test data from Humphreys County, Miss. [6] Test data from Leflore County, Miss.

TABLE 3.—*List of soil mapping units and some*

Soil symbol	Soil name	Brief description of soil to 40 inches depth	Depth to seasonably high water table	Depth from surface
			Feet	*Inches*
	Alligator clay:			
Ab	Nearly level phase	Poorly drained plastic clay	0–½	0–4
Aa	Level phase			4–24
	Alligator silty clay:			
Ae	Nearly level phase			24–40
Ad	Level phase			
Ac	Alligator clay, gently sloping phase	Poorly drained plastic clay	0–1	0–4 4–24 24–40
	Beulah very fine sandy loam:			
Bb	Nearly level phase	Somewhat excessively drained sandy loam over loamy sand.	6+	0–8
Bc	Gently sloping phase			8–17 17–40
	Beulah silty clay loam:			
Ba	Nearly level overwash phase	Somewhat excessively drained silty clay loam over loamy sand.	6+	0–8 8–17 17–40
	Bosket very fine sandy loam:			
Bd	Nearly level phase	Well-drained sandy loam to silty clay loam	4+	0–8
Be	Gently sloping phase			8–20 20–40
Ca	Clack-Bosket soils, nearly level phases [3]	Excessively drained sandy loam over sand	4+	0–8 8–16 16–36
	Commerce silt loam:			
Cb	Nearly level phase	Somewhat poorly drained to moderately well drained, stratified very fine sandy loam to silty clay loam.	1–2	0–10
Cc	Gently sloping phase			10–22 22–40
	Commerce silty clay:			
Cd	Level phase	Somewhat poorly drained, stratified silty clay to sandy loam.	1–2	0–10
Ce	Nearly level phase			10–22 22–40
	Commerce silty clay loam:			
Cg	Nearly level phase	Somewhat poorly drained to moderately well drained, stratified silty clay loam to sandy loam.	1–2	0–10
Ch	Gently sloping phase			10–22 22–40
Ck	Crevasse soils, nearly level phases	Excessively drained sandy loam over sand	4+	0–10 10–36 36–42+
Da	Dowling clay	Poorly drained depressional clays and silty clays	0–½	0–4
Db	Dowling soils			4–24 24–40+
Dc	Dubbs silt loam, nearly level phase	Moderately well drained to well drained very fine sandy loam to silty clay.	4+	0–8
	Dubbs very fine sandy loam:			
Dd	Nearly level phase			8–20
De	Gently sloping phase			20–40+
	Dundee very fine sandy loam:			
Do	Nearly level phase	Somewhat poorly drained to moderately well drained fine sandy loam to silty clay.	2–4	0–5
Dp	Gently sloping phase			5–15
	Dundee silt loam:			
Dg	Nearly level phase			15–27
Dh	Gently sloping phase			27–40+
	Dundee silty clay loam:			
Dm	Nearly level phase	Somewhat poorly drained to moderately well drained silty clay loam to silty clay.	2–4	0–5
Dk	Level phase			5–15
Dn	Gently sloping phase			15–27 27–40+

See footnotes at end of table.

estimated characteristics significant to engineering

Engineering soil classification [1]		Permeability	Structure	Available moisture-holding capacity	pH	Shrink-swell potential	Suitability as source of topping material
Unified	A. A. S. H. O.						
		Inches per hour		*Inches per foot*			
CH	A-7	(2)	Granular	3.0	5.1 to 6.0	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	5.1 to 6.0	Very high	Unsuitable.
CH	A-7	(2)	Massive	3.0	5.1 to 6.0	Very high	Unsuitable.
CH	A-7	(2)	Granular	3.0	5.1 to 6.0	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	5.1 to 6.0	Very high	Unsuitable.
CH	A-7	(2)	Massive	3.0	5.1 to 6.0	Very high	Unsuitable.
SM or ML	A-2 or A-4	2.5 to 5.0	Granular	1.2	5.6 to 6.5	Low	Good.
SM or ML	A-2 or A-4	2.5 to 5.0	Massive	1.2	5.6 to 6.5	Low	Good.
SM	A-2	5.0 to 10	Massive	1.0	5.6 to 6.0	Low	Good.
CL	A-6	0.2 to 0.8	Granular	2.0	5.6 to 6.5	Moderate	Poor.
SM or ML	A-2 or A-4	2.5 to 5.0	Massive	1.2	5.6 to 6.5	Low	Good.
SM	A-2	5.0 to 10	Massive	1.0	5.6 to 6.5	Low	Good.
SM or ML	A-2 or A-4	2.5 to 5.0	Crumb	1.2	5.6 to 6.5	Low	Good.
SC or CL	A-4 or A-6	0.8 to 2.5	Subangular blocky.	1.6	5.6 to 6.5	Moderate	Fair to good.
SM or ML	A-2 or A-4	2.5 to 5.0	Massive	1.4	5.6 to 6.5	Low	Good.
SM or ML	A-2 or A-4	5.0 to 10	Massive	.8	5.1 to 6.0	Low	Fair to good.
SM	A-2	10+	Massive	.7	5.1 to 6.0	Low	Fair to good.
SM	A-2	10+	Massive	.7	5.1 to 6.0	Low	Fair to good.
ML or CL	A-4	0.8 to 2.5	Granular	2.0	6.6 to 7.8	Low	Fair to good.
ML or CL	A-4 to A-6	0.8 to 2.5	Crumb	2.2	6.6 to 7.8	Low	Fair to good.
ML, CL, or SM	A-4, A-6, or A-2.	0.8 to 2.5	Massive	2.0	6.6 to 7.8	Low	Fair to good.
CH	A-7	(2)	Granular to blocky.	3.0	6.6 to 7.8	Very high	Unsuitable.
ML or CL	A-4 or A-6	0.8 to 2.5	Crumb	2.2	6.6 to 7.8	Low	Fair to good.
ML or CL	A-4 or A-6	0.8 to 2.5	Massive	2.0	6.6 to 7.8	Low	Fair to good.
CL	A-6	0.2 to 0.8	Granular	2.2	6.6 to 7.8	Moderate	Fair to good.
ML or CL	A-4 or A-6	0.8 to 2.5	Crumb	2.2	6.6 to 7.8	Moderate	Fair to good.
ML, CL, or SM	A-4, A-6, or A-2.	0.8 to 2.5	Massive	2.0	6.6 to 7.8	Low to moderate.	Fair to good.
SM or ML	A-2 or A-4	5.0 to 10+	Granular	.8	6.6 to 7.8	Low	Fair to good.
SM	A-2	10+	Massive	.7	6.6 to 7.8	Low	Fair to good.
SM	A-2	10+	Massive	.7	6.6 to 7.8	Low	Fair to good.
CH to ML	A-7 to A-4	(2)	Massive	3.0	5.6 to 7.3	Moderate to very high.	Unsuitable.
CH to ML	A-7 to A-4	(2)	Massive	3.0	5.6 to 7.3	Moderate to very high.	Unsuitable.
CH	A-7	(2)	Massive	3.0	5.6 to 7.3	Very high	Unsuitable
SM or ML	A-4	0.8 to 2.5	Crumb	1.6	5.1 to 6.0	Low	Fair to good.
CL or CH	A-6 or A-7	0.2 to 0.8	Subangular blocky.	1.8	5.1 to 6.0	Moderate to high.	Poor to fair.
SM or ML	A-4	8 to 2.5	Massive	1.5	5.1 to 6.5	Low	Fair to good.
ML or CL	A-4 or A-6	0.8 to 2.5	Granular	2.0	5.1 to 6.0	Low	Fair to good.
CL	A-7	0.2 to 0.8	Subangular blocky.	2.2	5.1 to 6.0	High	Poor.
CL	A-6	0.2 to 0.8	Subangular blocky.	2.2	5.1 to 6.0	Moderate	Poor.
ML or CL	A-4 or A-6	0.8 to 2.5	Massive	2.0	5.1 to 6.0	Low	Fair to good.
ML or CL	A-6	0.8 to 2.5	Granular	2.2	5.1 to 6.0	Moderate	Fair to good.
CL	A-7	0.2 to 0.8	Subangular blocky.	2.2	5.1 to 6.0	High	Poor.
ML or CL	A-6	0.2 to 0.8	Subangular blocky.	2.2	5.1 to 6.0	Moderate	Poor.
ML or CL	A-6	0.8 to 2.5	Massive	2.0	5.1 to 6.0	Moderate	Fair to good.

TABLE 3.—*List of soil mapping units and some*

Soil symbol	Soil name	Brief description of soil to 40 inches depth	Depth to seasonably high water table	Depth from surface
			Feet	*Inches*
	Dundee-Clack soils:			
Ds	Gently sloping phases	Characteristics of Dundee and Clack components are given separately.	----------	----------
Dr	Nearly level phases			
Dt	Sloping phases			
	Forestdale silt loam:			
Fa	Level phase	Poorly drained to somewhat poorly drained silt loam to clay.	½–1	0–5 5–24 24–40+
Fb	Nearly level phase			
	Forestdale silty clay loam:			
Fh	Nearly level phase	Same	½–1	0–4 4–26 26–53 53–72
Fg	Level phase			
Fk	Gently sloping phase			
	Forestdale silty clay:			
Fd	Nearly level phase	Poorly drained to somewhat poorly drained silty clay or clay over silty clay loam.	½–1	0–4 4–26 26–53
Fc	Level phase			
Fe	Gently sloping phase			
Ma	Mhoon silty clay, nearly level phase	Same	0–½	0–5 5–27 27–40+
	Robinsonville very fine sandy loam:			
Ra	Nearly level phase	Moderately well drained to well drained silt loam or very fine sandy loam.	4+	0–8 8–14 14–36 36–40
Rb	Gently sloping phase			
	Robinsonville-Crevasse soils:			
Rc	Nearly level phases	Characteristics of Robinsonville and Crevasse components given separately.	----------	----------
Rd	Gently sloping phases			
	Sharkey clay:			
Sb	Nearly level phase	Poorly drained plastic clay	0–½	0–4 4–24 24–40
Sa	Level phase			
	Sharkey silty clay:			
Sh	Nearly level phase			
Sg	Level phase			
Sd	Sharkey clay, gently sloping phase	Poorly drained plastic clay	0–1	0–4 4–24 24–40
Sk	Sharkey silty clay, gently sloping phase			
Se	Sharkey silt loam, nearly level overwash phase.	Poorly drained silt loam over plastic clay	0–1	0–6 6–24 24–40
Sc	Sharkey clay, nearly level phase, shallow over sand.	Somewhat poorly drained clay over silty clay loam to sand.	2–4	0–4 4–20 20–26 26–40
	Sharkey-Clack soils:			
Sm	Nearly level phases	Characteristics of Sharkey and Clack components are given separately.	----------	----------
Sn	Gently sloping phases			
So	Souva silt loam	Somewhat poorly drained depressional silt loams and silty clay loams that overlie silty clay in places.	0–½	0–5 5–17 17–28 28–40
	Tunica silty clay:			
Ta	Nearly level phase	Somewhat poorly drained clay over silty clay loam to sand.	2–4	0–4 4–20 20–26 26–40
Tb	Gently sloping phase			

[1] See text for explanation of symbols.

[2] Less than 0.05 inch.

estimated characteristics significant to engineering—Continued

Engineering soil classification [1]		Permeability	Structure	Available moisture-holding capacity	pH	Shrink-swell potential	Suitability as source of topping material
Unified	A. A. S. H. O.						
		Inches per hour		*Inches per foot*			
--	--	--	--	--	--	--	
ML or CL	A-4 or A-6	0.8 to 2.5	Granular	1.8	5.6 to 6.0	Low	Fair to good.
CH	A-7	0.05 to 0.2	Subangular blocky.	2.2	5.6 to 6.0	High	Unsuitable.
CL or CH	A-6 or A-7	0.2 to 0.8	Subangular blocky to massive.	2.2	5.6 to 6.0	Moderate	Poor.
CL	A-6	0.2 to 0.8	Crumb	2.5	5.6 to 6.0	Moderate	Poor.
CL or CH	A-7	0.05 to 0.2	Subangular blocky.	2.5	5.6 to 6.0	High	Unsuitable.
CL	A-6 or A-7	0.2 to 0.8	Subangular blocky.	2.5	5.6 to 6.0	Moderate	Poor.
CL	A-6	0.2 to 0.8	Massive	2.5	5.6 to 6.0	Moderate	Poor
CH	A-7	0.05 to 0.2	Crumb	3.0	5.6 to 6.0	High	Unsuitable.
CH	A-7	0.05 to 0.2	Subangular blocky.	3.0	5.6 to 6.0	Very high	Unsuitable.
CL or CH	A-6 or A-7	0.2 to 0.8	Subangular blocky to massive.	3.0	5.6 to 6.0	Very high to moderate.	Poor.
CL or MH	A-6 or A-7	(2)	Granular	3.0	6.6 to 7.8	Very high	Unsuitable.
MH or CH	A-7	(2)	Massive	3.0	6.6 to 7.8	High	Unsuitable.
CL, CH, or MH	A-6 or A-7	0.2 to 0.8	Massive	2.5	6.6 to 7.8	Moderate	Poor.
SM or ML	A-2 or A-4	0.8 to 2.5	Granular	1.6	6.6 to 7.8	Low	Good.
SM or ML	A-2 or A-4	0.8 to 2.5	Massive	1.6	6.6 to 7.8	Low	Good.
SM	A-2	0.8 to 2.5	Massive	1.4	6.6 to 7.8	Low	Good.
SM	A-2	2.5 to 5.0	Massive	1.4	6.6 to 7.8	Low	Good.
--	--	--	--	--	--	--	
CH	A-7	(2)	Granular	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Massive	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Granular	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Massive	3.0	6.1 to 7.0	Very high	Unsuitable.
ML or CL	A-4 or A-6	0.2 to 0.8	Granular	2.0	6.1 to 7.3	Low	Fair to good.
CH	A-7	(2)	Blocky	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Massive	3.0	6.1 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Granular	3.0	6.6 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	6.6 to 7.3	Very high	Unsuitable.
CL or CH	A-6 or A-7	0.2 to 0.8	Massive	2.2	6.3 to 7.3	Moderate	Poor to fair.
ML, CL, or SM.	A-4, A-7, or A-2.	0.8 to 2.5	Massive	2.0	6.6 to 7.5	Low to moderate.	Fair to good.
ML or CL	A-4 or A-6	0.2 to 0.8	Granular	2.0	5.6 to 6.0	Low	Fair to good.
CL	A-6 or A-7	0.05 to 0.2	Subangular blocky.	2.2	5.6 to 6.0	Moderate	Poor to fair.
CL or CH	A-6 or A-7	0.05 to 0.2	Granular	2.2	5.6 to 6.0	Moderate	Poor to fair.
ML, CL, or CH.	A-4, A-6, or A-7.	0.2 to 0.8	Subangular blocky.	2.0	6.1 to 6.5	Low to moderate.	Fair to good.
CH	A-7	(2)	Granular	3.0	6.6 to 7.3	Very high	Unsuitable.
CH	A-7	(2)	Blocky	3.0	6.6 to 7.3	Very high	Unsuitable.
CL or CH	A-6 or A-7	0.2 to 0.8	Massive	2.2	6.3 to 7.3	Moderate	Poor to fair.
ML, CL, or SM.	A-4, A-7, or A-2.	0.8 to 2.5	Massive	2.0	6.6 to 7.5	Low to moderate.	Fair to good.

[3] The characteristics described are those of Clack sandy loam. Characteristics of the Bosket component are given separately.

TABLE 4.—*Classification of soils by American Association of State Highway Officials* [1]

General classification	Granular materials (35 percent or less passing No. 200 sieve)							Silt-clay materials (More than 35 percent passing No. 200 sieve)				
Group classification	A-1		A-3	A-2				A-4	A-5	A-6	A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5	A-7-6
Sieve analysis: Percent passing—												
No. 10	50 maximum.											
No. 40	30 maximum.	50 maximum.	51 minimum.									
No. 200	15 maximum.	25 maximum.	10 maximum.	35 maximum.	35 maximum.	35 maximum.	35 maximum.	36 minimum.	36 minimum.	36 minimum.	36 minimum.	36 minimum.
Characteristics of fraction passing No. 40 sieve:												
Liquid limit			NP [2]	40 maximum.	41 minimum.	40 maximum.	41 minimum.	40 maximum.	41 minimum.	40 maximum.	41 minimum.	41 minimum.
Plasticity index	6 maximum.	6 maximum.	NP [2]	10 maximum.	10 maximum.	11 minimum.	11 minimum.	10 maximum.	10 maximum.	11 minimum.	11 minimum.[3]	11 minimum.[3]
Group index	0	0	0	0	0	4 maximum.	4 maximum.	8 maximum.	12 maximum.	16 maximum.	20 maximum.	20 maximum.
Usual types of significant constituent materials.	Stone fragments, gravel, and sand.	Stone fragments, gravel, and sand.	Fine sand.	Silty gravel and sand.	Silty gravel and sand.	Clayey gravel and sand.	Clayey gravel and sand.	Nonplastic to moderately plastic silty soils.	Highly elastic silts.	Medium plastic clays.	Highly plastic clays.	Highly plastic clays.
General rating as subgrade.	Excellent to good					Fair to poor						

[1] Based on Standard Specifications for Highway Materials and Methods of Sampling and Testing (pt. 1; ed. 7): The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes, A. A. S. H. O. Designation: M 145-49.

[2] NP=nonplastic.

[3] Plasticity index of A 7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30.

Conservation Engineering

This subsection is for farmers and farm engineers interested in draining, irrigating, and leveling soils. It explains the methods now used in the county. In planning irrigation, drainage, or leveling of a soil, it will be helpful to study the engineering properties of that soil, as shown in table 3.

Drainage

A good drainage system is essential if the farmlands of Coahoma County are to be used efficiently. Much work has been done in the past to improve drainage, but many additional improvements are needed. Some of the requisites for improving the drainage on farms are discussed in the following paragraphs.

1. Outlets.—Adequate outlets are essential to good drainage. The numerous streams and bayous in the county would appear to provide ample outlets. Over the years, however, the natural levees have built up until the streams are at higher elevations than the surrounding areas. Many of the deeper natural drains are choked with brush and vegetation that keep them from carrying a normal amount of water. They should be improved by running dragline ditches into the slack-water areas to provide outlets for farm drainage and by cleaning out the streams and bayous. This has been done in many places by workers employed by the drainage districts and the Corps of Army Engineers.

2. Secondary drainage ditches.—These ditches are usually cut with a dragline and are trapezoidal in shape. They have a minimum depth of 4 feet and have 1:1 side slopes. Sometimes this type of lateral ditch serves only one farm, but usually it provides drainage for several farms.

3. V-type and W-type ditches.—These ditches serve as field drains to carry water from the terraces and rows to secondary drains. As the name implies, the V-type ditch is shaped like the letter V. It has 3:1 side slopes, which make it relatively wide at the top if it is fairly deep. This type of ditch is generally designed to remove 2 inches of water over a period of 24 hours. It is easy to maintain and can be crossed by farm machinery. It can also be used as a place for turning farm machinery. Nevertheless, in spite of these advantages, it is difficult to get water into this type of ditch unless the spoil has been leveled or special provisions have been made.

The W-type ditch is used to drain water from the rows or from pockets where it tends to collect (fig. 7). It is built by moving the spoil from two small parallel ditches toward the center of the area between the ditches. This raises the height of the spoil between the ditches and makes it easy to get water from the rows into the ditch. The raised center between the ditches can be cultivated across or can be used as a road or turn row.

4. Row arrangement.—The arrangement of rows is an important factor in providing drainage on farms. The rows should be arranged so as to remove excess surface water slowly enough to prevent erosion. For most of the soils in the county, the best grade for this is 0.3 of a foot

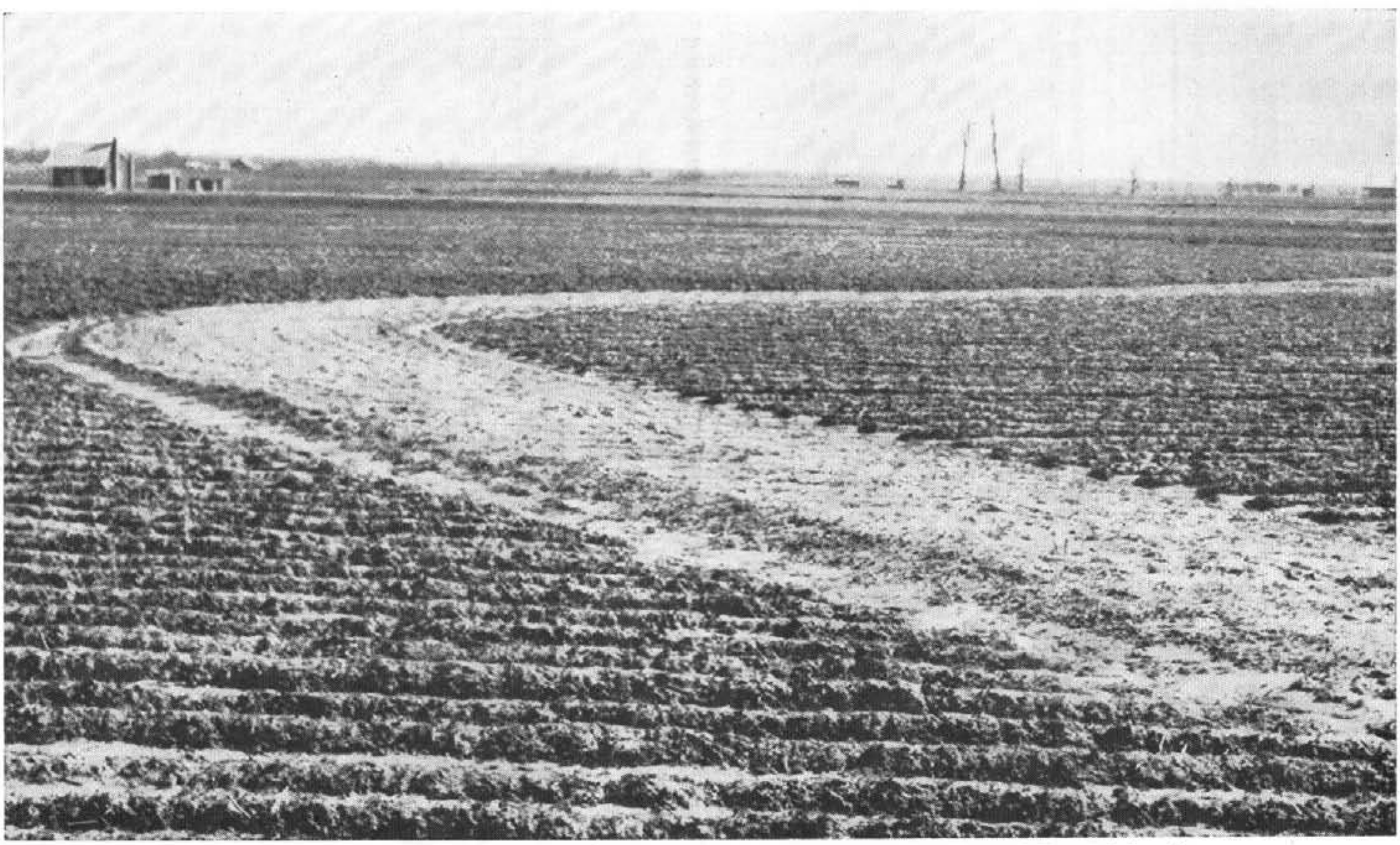

Figure 7.—**A W-type ditch, which provides an outlet for the rows on Dundee and Forestdale soils.**

TABLE 5.—*Characteristics of soil groups*

Major divisions	Group symbol	Soil description	Value as foundation material [2]	Value as base course directly under bituminous pavement
Coarse-grained soils (*50 percent or less passing No. 200 sieve*):				
Gravels and gravelly soils (*more than half of coarse fraction retained on No. 4 sieve*).	GW	Well-graded gravels and gravel-sand mixtures; little or no fines.	Excellent	Good
	GP	Poorly graded gravels and gravel-sand mixtures; little or no fines.	Good to excellent	Poor to fair
	GM	Silty gravels and gravel-sand-silt mixtures.	Good	Poor to good
	GC	Clayey gravels and gravel-sand-clay mixtures.	Good	Poor
Sands and sandy soils (*more than half of coarse fraction passing No. 4 sieve*).	SW	Well-graded sands and gravelly sands; little or no fines.	Good	Poor
	SP	Poorly graded sands and gravelly sands; little or no fines.	Fair to good	Poor to not suitable.
	SM	Silty sands and sand-silt mixtures	Same	Same
	SC	Clayey sands and sand-clay mixtures	Same	Not suitable
Fine-grained soils (*more than 50 percent passing No. 200 sieve*):				
Silts and clays (*liquid limit of 50 or less*)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, and clayey silts of slight plasticity.	Fair to poor	Not suitable
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, and lean clays.	Same	Not suitable
	OL	Organic silts and organic clays having low plasticity.	Poor	Not suitable
Silts and clays (*liquid limit greater than 50*).	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, and elastic silts.	Poor	Not suitable
	CH	Inorganic clays having high plasticity and fat clays.	Poor to very poor	Not suitable
	OH	Organic clays having medium to high plasticity and organic silts.	Same	Not suitable
Highly organic soils	Pt	Peat and other highly organic soils	Not suitable	Not suitable

[1] Based on information in the Unified Soil Classification System, Tech. Memo. No. 3–357, v. 1, 2, and 3, Waterways Experiment Station, Corps of Engineers, 1953 (*15*). Ratings and ranges in test values are for guidance only. Design should be based on field survey and test of sample from construction site.

in Unified soil classification system [1]

Value for embankments	Compaction: Characteristics and recommended equipment	Approximate range in A. A. S. H. O. maximum dry density [3]	Field (in-place) CBR	Subgrade modulus k	Drainage characteristics	Comparable groups in A. A. S. H. O. classification
		Lb./cu. ft.		*Lb./sq. in./in.*		
Very stable; use in pervious shells of dikes and dams.	Good; use crawler-type tractor, pneumatic-tire roller, or steel-wheel roller.	125–135	60–80	300+	Excellent	A–1.
Reasonably stable; use in pervious shells of dikes and dams.	Same	115–125	25–60	300+	Excellent	A–1.
Reasonably stable; not particularly suited to shells but may be used for impervious cores or blankets.	Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	120–135	20–80	200–300+	Fair to practically impervious.	A–1 or A–2.
Fairly stable; may be used for impervious core.	Fair, use pneumatic-tire or sheepsfoot roller.	115–130	20–40	200–300	Poor to practically impervious.	A–2.
Very stable; may be used in pervious sections; slope protection required.	Good; use crawler-type tractor or pneumatic-tire roller.	110–130	20–40	200–300	Excellent	A–1.
Reasonably stable; may be used in dike section having flat slopes.	Same	100–120	10–25	200–300	Excellent	A–1 or A–3.
Fairly stable; not particularly suited to shells but may be used for impervious cores or dikes.	Good, but needs close control of moisture; use pneumatic-tire or sheepsfoot roller.	110–125	10–40	200–300	Fair to practically impervious.	A–1, A–2, or A–4.
Fairly stable; use as impervious core for flood-control structures.	Fair; use pneumatic-tire roller or sheepsfoot roller.	105–125	10–20	200–300	Poor to practically impervious.	A–2, A–4, or A–6.
Poor stability; may be used for embankments if properly controlled.	Good to poor; close control of moisture is essential; use pneumatic-tire or sheepsfoot roller.	95–120	5–15	100–200	Fair to poor	A–4, A–5, or A–6.
Stable; use in impervious cores and blankets.	Fair to good; use pneumatic-tire or sheepsfoot roller.	95–120	5–15	100–200	Practically impervious.	A–4, A–6, or A–7.
Not suitable for embankments.	Fair to poor; use sheepsfoot roller.[4]	80–100	4–8	100–200	Poor	A–4, A–5, A–6, or A–7.
Poor stability; use in core of hydraulic fill dam; not desirable in rolled fill construction.	Poor to very poor; use sheepsfoot roller.[4]	70–95	4–8	100–200	Fair to poor	A–5 or A–7.
Fair stability on flat slopes; use in thin cores, blankets, and dike sections of dams.	Fair to poor; use sheepsfoot roller.[4]	75–105	3–5	50–100	Practically impervious.	A–7.
Not suitable for embankments.	Poor to very poor; use sheepsfoot roller.[4]	65–100	3–5	50–100	Same	A–5 or A–7.
Not used in embankments, dams, or subgrades for pavements					Fair to poor	None.

[2] Ratings are for subgrade and subbases for flexible pavement.
[3] Determined in accordance with test designation: T 99–49, A. A. S. H. O.
[4] Pneumatic-tire rollers may be advisable, particularly when moisture content is higher than optimum.

fall per 100 feet of row length. Care is necessary to keep the rows short enough so that the volume of water to be handled is not too large, and the rows should be run parallel to the natural pattern of the land. W-type ditches are desirable because, with this type of ditch, farm machinery can be operated more efficiently than with some other types, the stand of crops is more uniform, and the field is divided into rows in which the moisture is uniform throughout.

Irrigation

In humid areas the margin of profit between growing irrigated crops and nonirrigated crops is narrower than in arid climates. The farmer who wishes to irrigate his crops must not only have an irrigation system that is designed and operated efficiently, but he must also practice good conservation and maintain a high level of management if he is to receive the maximum benefits. Good management includes using proper row arrangement and tillage, rotating crops, fertilizing the soils, and controlling insects. The operator must also provide for removing excess water without causing erosion.

Although the average annual precipitation of Coahoma County is approximately 49.04 inches, supplementary irrigation is needed during much of the growing season, even in normally wet years. The reason that moisture is inadequate is that the rainfall is not distributed evenly. Much of it falls during the winter; from June through September there is not enough to permit optimum growth of plants. Fortunately, the soil acts as a reservoir. It stores excess water during periods of abundant rainfall and releases it during dry periods.

A greater amount of moisture is held by some soils than by others. A clayey soil, for example, will hold more moisture than a sandy soil. This ability to store water is called the available moisture-holding capacity and is measured in inches per foot of soil depth.

Even though the soil stores water, there is still not enough for plants during the growing season. The average monthly deficit is influenced by the storage capacity of the soil during June and July. During August and September, however, the average moisture deficiency is about 5.25 inches, regardless of the storage capacity of the soil.

To help offset the deficiency in moisture, three types of irrigation are used in Coahoma County. These are the sprinkler method, the graded furrow method, and the contour border method. Each method has certain advantages and limitations. These are discussed in the following paragraphs.

1. The sprinkler method consists of spraying water into the air. The water falls in a uniform pattern similar to rainfall. With this method, water is applied a little less rapidly than the soil can absorb it. This method has the advantage of being suited to all kinds of soils and slopes. Also, exact amounts of water can be applied. Nevertheless, considerable labor is required for this method to operate efficiently.

2. The graded furrow method consists of releasing the water into the furrows between the rows from a high point in the field. The water moves slowly down the furrows and seeps into the soil as it advances. This method is suitable for medium-textured to moderately fine textured soils. It also works well on fine textured soils that crack when dry, but the soil should not be irrigated until the cracks are fairly large.

After it has been installed, the graded furrow method requires less labor than the sprinkler method. It has the disadvantage, however, of being suitable for use only on comparatively level land. Preparation for this type of irrigation ranges from minor smoothing to a complete leveling. In this system the water is used less efficiently than when the sprinkler system is used.

3. The contour border method consists of applying water to small areas of land faster than it can be absorbed. The water spreads over the area and is retained by contour levees until it infiltrates to the desired depth. The water that has not been absorbed is then released and drains off into a similar area. This method requires little labor, and it can be used on slopes to better advantage than the furrow method. Also, it requires less preparation of the land and is efficient in the use of water. The range of crops that can be grown when this method is used, however, is narrower than where either of the other two methods is used. With this type of irrigation, pasture grasses, hay, and rice are commonly grown. Cotton, corn, and some other row crops also do well. If row crops are grown under this type of irrigation, however, the levee strips should be disked down early to destroy the weeds.

Leveling

Land is leveled to provide for better surface drainage, to help in controlling irrigation water, and to prepare the land for the use of mechanized equipment. In 1956, more than 700 acres was leveled in Coahoma County. Three types of leveling were used—land smoothing, rough grading, and land leveling. These are described as follows:

(1) Land smoothing consists of removing the minor surface irregularities without altering the general topographic pattern of the land. Often the irregularities are so slight that they are not apparent to the eye. Land smoothing is done by using landplanes, levelers, or floats.

(2) Rough grading consists of removing the knolls, mounds, or ridges and filling in the pockets and low areas. Irregularities of this type are much greater than those discussed under land smoothing. The cuts are comparatively heavy, often amounting to more than 2 feet. For this operation, large earth-moving equipment is required. Rough grading is usually followed by the smoothing operation.

(3) Land leveling consists of grading the surface of the land to a predetermined plane or series of planes. The planes may be level, but they generally slope in the direction the rows run, and at right angles to the rows. A topographic map and a grading plan will be necessary to accomplish this. Essentially the same equipment is used for this operation as for land smoothing and rough grading. Although the immediate effects of land leveling have been favorable in this county, the system has not been tried over a long enough period to determine the long-term benefits.

Highway Construction

Some of the problems encountered in designing, constructing, and maintaining highways are caused by the characteristics of the soils or by drainage. The bedrock in this county presents no great problem because it occurs at great depths. The depth of the bedrock, however, is a handicap in some engineering projects; the bedrock is at too great a depth to be used as a footing for foundations; artificial bases for large buildings, roads, and bridges must be built instead of using the natural bedrock.

The data given in table 3 are useful in evaluating the soils for use in highways. The Alligator, Dowling, and Sharkey soils and the upper parts of the profiles of the Mhoon and Tunica soils shrink greatly when dry and swell when wet. Consequently, these very plastic soils are unsuitable for use as subgrades on which to lay pavements. When they are used as subgrades, the pavements crack and warp because the soils expand and contract. The cracking and warping can be minimized if a thick layer of a soil that has low volume change is used as a foundation course beneath the pavement. The foundation course should extend through the shoulder of the road.

Table 3 also shows the general suitability of the various soils as a source of topping material. The topping material should be composed of sandy clay, semigravel, gravel that contains considerable clay, soil that is gravelly, or friable soil all of which passes a 1-inch screen. The portion that passes the No. 40 sieve must have a liquid limit that does not exceed 25 and a plasticity index of not more than 6 when used as a base for bituminous surfacing. Sandy loams or loamy sands are more suitable than other soils for use as topping material on the shoulders of roads and will support a limited amount of traffic.

Table 3 shows that many soils have a high water table or that water is ponded on the surface for long periods each year. Roads on these soils should be constructed on embankment sections and provided with an adequate system of underdrains and surface drains. In lowlands and other areas that are flooded, roads are best constructed on a continuous embankment that is several feet above the level of frequent floods. The swampy soils provide a poor foundation for roads; hence, the swampy soil materials should be removed from the roadway section and replaced by more stable material.

The natural levees are generally the best sites for roads because they have good surface drainage. Some of the soils developed on natural levees are composed of sandy materials that are well suited to use for the foundations of pavements. Any of the medium-textured soils are suitable for roads through farms or fields, but good surface drainage is required for the roadbed and shoulders.

Descriptions of Soils

This section gives detailed information about the soils of Coahoma County. In it the soil series are described in approximately alphabetic order. A brief description of each soil, or mapping unit, is given following the description of the series. The soils are shown on the detailed soil map by a letter symbol that is bounded by lines. For more generalized information about the soils, the reader can refer to the section, Soil Associations, in which the broad patterns of soils are explained. The approximate acreage, present use, and proportionate extent of the soils mapped in Coahoma County are shown in table 6.

TABLE 6.—*Acreage and proportionate extent of the soils mapped*

Soil	Cultivated	Forest	Idle	Pasture	Acres	Percent
Alligator clay:						
Level phase	3, 631	3, 417	22	0	7, 070	2. 0
Nearly level phase	24, 803	5, 216	213	200	30, 432	8. 3
Gently sloping phase	349	8	0	5	362	. 1
Alligator silty clay:						
Level phase	237	131	11	0	379	. 1
Nearly level phase	1, 730	412	9	12	2, 163	. 6
Alluvial soils	0	48, 213	0	0	48, 213	13. 2
Beulah silty clay loam, nearly level overwash phase	244	0	0	0	244	. 1
Beulah very fine sandy loam:						
Nearly level phase	787	0	0	125	912	. 2
Gently sloping phase	240	0	0	32	272	. 1
Bosket very fine sandy loam:						
Nearly level phase	9, 268	0	4	123	9, 395	2. 6
Gently sloping phase	1, 120	4	0	14	1, 138	. 3
Clack-Bosket soils, nearly level phases	67	8	8	327	410	. 1
Commerce silt loam:						
Nearly level phase	7, 627	57	16	74	7, 774	2. 1
Gently sloping phase	208	0	0	3	211	. 1
Commerce silty clay:						
Level phase	265	0	0	9	274	. 1
Nearly level phase	2, 350	51	50	22	2, 473	. 7
Commerce silty clay loam:						
Nearly level phase	4, 637	8	38	106	4, 789	1. 3
Gently sloping phase	333	3	0	19	355	. 1
Crevasse soils, nearly level phases	246	195	0	84	525	. 1
Dowling clay	16, 864	16, 805	732	288	34, 689	9. 5
Dowling soils	14, 021	4, 015	143	296	18, 475	5. 1
Dubbs silt loam, nearly level phase	803	11	0	6	820	. 2
Dubbs very fine sandy loam:						
Nearly level phase	19, 415	59	9	286	19, 769	5. 4
Gently sloping phase	1, 230	9	12	26	1, 277	. 4

TABLE 6.—*Acreage and proportionate extent of the soils mapped*—Continued

Soil	Cultivated	Forest	Idle	Pasture	Acres	Percent
Dundee silt loam:						
Nearly level phase	17, 327	211	31	239	17, 808	4. 9
Gently sloping phase	692	6	0	28	726	. 2
Dundee silty clay loam:						
Level phase	177	1	3	23	204	. 1
Nearly level phase	18, 779	408	24	134	19, 345	5. 3
Gently sloping phase	1, 375	24	0	44	1, 443	. 4
Dundee very fine sandy loam:						
Nearly level phase	21, 390	161	98	190	21, 839	6. 0
Gently sloping phase	1, 023	16	0	88	1, 127	. 3
Dundee-Clack soils:						
Nearly level phases	965	0	10	0	975	. 3
Gently sloping phases	1, 025	9	24	27	1, 085	. 3
Sloping phases	383	25	88	321	817	. 2
Forestdale silt loam:						
Level phase	149	109	60	0	318	. 1
Nearly level phase	3, 898	178	6	17	4, 099	1. 1
Forestdale silty clay:						
Level phase	991	325	33	0	1, 349	. 4
Nearly level phase	12, 022	1, 412	6	99	13, 539	3. 7
Gently sloping phase	479	0	0	3	482	. 1
Forestdale silty clay loam:						
Level phase	409	57	74	0	540	. 1
Nearly level phase	14, 969	2, 197	78	81	17, 325	4. 7
Gently sloping phase	103	6	0	0	109	(1)
Mhoon silty clay, nearly level phase	81	28	1	0	110	(1)
Robinsonville very fine sandy loam:						
Nearly level phase	2, 222	26	0	53	2, 301	. 6
Gently sloping phase	166	9	0	12	187	. 1
Robinsonville-Crevasse soils:						
Nearly level phases	1, 459	89	96	177	1, 821	. 5
Gently sloping phases	342	35	14	11	402	. 1
Sharkey clay:						
Level phase	5, 368	1, 812	11	422	7, 613	2. 1
Nearly level phase	17, 665	3, 335	221	437	21, 658	5. 9
Nearly level phase, shallow over sand	120	0	0	0	120	(1)
Gently sloping phase	666	3	5	5	679	. 2
Sharkey silty clay:						
Level phase	196	0	0	0	196	. 1
Nearly level phase	1, 741	51	0	0	1, 792	. 5
Gently sloping phase	147	0	0	0	147	(1)
Sharkey silt loam, nearly level overwash phase	232	10	25	0	267	. 1
Sharkey-Clack soils:						
Nearly level phases	679	0	0	0	679	. 2
Gently sloping phases	359	3	4	0	366	. 1
Souva silt loam	1, 449	129	23	44	1, 645	. 5
Tunica silty clay:						
Nearly level phase	6, 088	77	32	190	6, 387	1. 8
Gently sloping phase	1, 083	73	12	27	1, 195	. 3
Swamps, lakes, towns, and other areas not covered by soil survey					21, 684	5. 9
Total					364, 800	100. 0

[1] Less than 0.1 percent.

Alligator Series

The Alligator soils are poorly drained and have developed from light-colored, slack-water sediments that were deposited by the Mississippi River. They have a thin surface layer of dark clay and a light-gray clay subsoil that is prominently mottled with yellow and brown. These soils are medium to strongly acid. They contract and crack extensively when dry and expand and seal over when wet.

These soils occupy about 12 percent of the acreage in the county. They occur mainly in the eastern half of the county in association with the Sharkey, Tunica, and Dowling soils. The Alligator soils are lighter colored than the Sharkey. They have poorer drainage and are finer textured than the Tunica. In contrast to the Dowling soils, which occur in depressions, they occur mainly on level to nearly level areas, although some are on steeper slopes.

The Alligator soils are difficult to manage, and a large acreage has never been cleared. The forests on these soils consist of bitter pecan, cottonwood, American elm, honeylocust, sugarberry, sweetgum, and various types of water-tolerant oaks.

Alligator clay, nearly level phase (½ to 3 percent slopes) (Ab).—This soil occurs on a ridge-depressional type of topography at higher elevations than some of the other

Alligator soils. It is the most extensive of the Alligator soils.

Soil profile:

A_p 0 to 4 inches, grayish-brown (10YR 5/2) clay; medium to fine granular structure; very hard when dry, very plastic when wet; medium to strongly acid; 4 to 8 inches thick; abrupt lower boundary.

C_{11g} 4 to 24 inches, light-gray (10YR 7/1) clay mottled with yellowish brown (10YR 5/6); moderate medium to coarse blocky structure when dry; very hard when dry, very plastic when wet; medium to strongly acid; 20 to 30 inches thick; gradual lower boundary.

C_{12g} 24 to 40 inches, gray (10YR 5/1) clay faintly mottled with dark yellowish brown (10YR 4/4); massive; very hard when dry, very plastic when wet; medium to strongly acid.

The content of organic matter is fairly high when the soil is first cleared. It decreases rapidly when the soil is tilled, unless special efforts are made to maintain it. Surface runoff is slow to moderately slow. When the soil is wet, water moves through it very slowly. The available moisture-holding capacity is very high.

Present use and management.—Most of this soil has been used to grow cotton and soybeans. Recently, a large acreage has been used for pasture or has been planted to small grains and rice, which on this soil is a high-yielding crop.

This soil needs drainage if it is to be cultivated. V- or W-type ditches that empty into larger ditches generally provide adequate drainage if the rows are run with the slope.

Under good management and with good weather, moderately high yields of most of the crops grown locally are obtained, but corn is an uncertain crop. The soil requires nitrogen. Lime is needed for alfalfa and other legumes. Tilth is poor, and because of the heavy surface texture, it is hard to improve. This soil is in capability unit 18 (IIIs–4).

Alligator clay, level phase (0 to ½ percent slopes) (Aa).—This soil occurs on broad, level areas at lower elevations than some of the other Alligator clays. More than half of it is in forest. The crops grown on it are similar to those grown on Alligator clay, nearly level phase, and the management is about the same. It is more difficult to provide surface drainage on this soil, however, and the growing of crops is more hazardous. This soil is in capability unit 22 (IIIw–11).

Alligator clay, gently sloping phase (3 to 7 percent slopes) (Ac).—This soil generally occurs in narrow bands along old streambanks. Surface runoff is more rapid than on the nearly level soils. Some galled spots occur on this soil, and small areas are moderately eroded.

Almost all of this soil is used for pasture or to grow soybeans, cotton, and small grains. Organic matter is needed. Contour tillage and the use of cover crops as much of the time as feasible help to prevent excessive surface runoff and erosion. This soil is in capability unit 15 (IIIe–6).

Alligator silty clay, nearly level phase (½ to 3 percent slopes) (Ae).—This soil occurs in the same general areas as the other Alligator soils. The silty clay texture of the surface layer may have been the result, in part, of the soil having received overwash from higher lying areas. This soil is used and managed in about the same way as Alligator clay, level phase. It is in capability unit 18 (IIIs–4).

Alligator silty clay, level phase (0 to ½ percent slopes) (Ad).—This soil occurs on low, broad flats in the same general areas as the other Alligator soils. It is used and managed in about the same way as Alligator clay, level phase, and it is in capability unit 22 (IIIw–11).

Alluvial Soils

Alluvial soils (Ag).—These soils occur in large, wooded areas between the Mississippi River and its levees. They are frequently flooded in spring and early in summer, Many different soils are included. The soils range in texture from sand to clay, and in drainage, from poor to excessive. Normally, they are neutral or mildly alkaline.

Most of these soils are nearly level, but some areas along streambanks and in depressions have steeper slopes. The principal soil series in this group are the Commerce, Crevasse, Robinsonville, and Tunica.

If these soils were cleared and protected from floods, they would be very productive. Some of the higher lying areas have been used for cultivated crops despite the hazard of floods. These higher areas are included in other mapping units. This mapping unit is not in a capability unit.

Beulah Series

The Beulah soils are nearly level to gently sloping and are somewhat excessively drained. They have developed from moderately coarse textured alluvium and occur on old natural levees. These soils normally have a brown or light grayish-brown surface layer and a brown subsoil. The texture of both these layers is very fine sandy loam. Horizon differentiation is weak and consists largely of differences between the color of the surface layer and subsoil. The soils are acid throughout.

The Beulah soils make up less than 1 percent of the total acreage of the county, but the areas in the northwestern part of the county are fairly large. These soils are associated with the Clack and Bosket soils. The Beulah soils are generally coarser textured and have more profile development than the Clack soils. They are coarser textured than the Bosket, and the Bosket are well drained instead of somewhat excessively drained.

Most of the Beulah soils are used for crops, but droughtiness somewhat limits their use. The natural vegetation is rock elm, blackgum, bitter pecan, water oak, sweetgum, sycamore, and an undergrowth of vines and cane.

Beulah very fine sandy loam, nearly level phase (½ to 3 percent slopes) (Bb).—This soil occurs on wide ridges near the beds of old, abandoned streams. It is the most extensive of the Beulah soils.

Soil profile:

A 0 to 8 inches, brown (10YR 5/3) very fine sandy loam; weak fine granular structure; loose when dry, very friable when moist; medium to slightly acid; 6 to 10 inches thick; clear lower boundary.

B 8 to 17 inches, very pale brown (10YR 7/3) very fine sandy loam; essentially structureless; loose when dry, very friable when moist; medium to slightly acid; 17 to 30 inches thick; clear lower boundary.

C 17 to 40 inches, pale-brown (10YR 6/3) loamy fine sand; structureless; loose when dry, very friable when moist; medium acid.

Both the surface layer and the B horizon range in texture from very fine sandy loam to sandy loam. The

B horizon ranges in color from very pale brown to light yellowish brown. Most of the areas contain small patches of coarser textured soils.

Except where a plowsole, or compacted layer, is present, water moves rapidly through this soil. The available moisture-holding capacity is low, and the soil has a low content of organic matter.

Present use and management.—More than 85 percent of this soil is in crops, and the rest is in pasture. Cotton yields well on this soil, except during periods of drought. The soil is rarely soggy. It is suitable for early grazing, especially if it is seeded to small grains or cover crops. The content of organic matter needs to be built up and maintained to improve tilth and to increase the moisture-holding capacity. Plowsoles, or compacted layers, where present, are best broken by deep tillage when the soil is dry. This soil is in capability unit 4 (IIs–1).

Beulah very fine sandy loam, gently sloping phase (3 to 7 percent slopes) (Bc).—This soil occurs on narrow slopes near the beds of old, abandoned streams. The crops grown on it are similar to those grown on Beulah very fine sandy loam, nearly level phase, and management is about the same. Because the soil absorbs water rapidly, surface runoff is very slow and erosion has been negligible. This soil is in capability unit 16 (IIIs–1).

Beulah silty clay loam, nearly level overwash phase (½ to 3 percent slopes) (Ba).—This soil occupies areas in which a layer of moderately fine textured material has been deposited over a soil that has a typical Beulah profile. The moderately fine textured material ranges in thickness from 4 to 12 inches and in color from light grayish brown to dark grayish brown. Outcrops of sandy material, too small to map separately, occur in most of the areas. A few areas of steeper soils are also included. Movement of water into the surface layer is moderately slow.

This soil has a higher content of clay in the surface layer and a higher available moisture-holding capacity than the Beulah very fine sandy loams. Therefore, the effects of drought are less severe on this soil, and yields are slightly higher, but working the soil is more difficult. Tilth can be improved by incorporating organic matter into the soil. This soil is in capability unit 4 (IIs–1).

Bosket Series

The Bosket soils are well drained and are nearly level to gently sloping. They occur on old natural levees. These soils have a surface layer of light grayish-brown to brown very fine sandy loam and a subsoil of dark-brown silty clay loam or sandy clay loam. The structural development is weak. The texture of the underlying material ranges from very fine sandy loam to loamy sand, and the soils are slightly acid to strongly acid.

The Bosket soils make up about 3 percent of the total acreage of the county. They occur in association with Beulah, Dubbs, Dowling, and Souva soils. The Bosket soils differ from the Beulah in having a subsoil of sandy clay loam or silty clay loam, and their profiles are more highly developed. They are better drained and are coarser textured throughout than the Dubbs soils, but their profile is not so well developed. Unlike the Bosket soils, the Dowling and Souva soils occur in depressions.

Almost all areas of Bosket soils have been cleared and are being farmed. The soils are well suited to cultivated crops. The natural forest cover is made up of water oak, bitter pecan, sassafras, sycamore, sweetgum, winged elm, and an undergrowth of vines and cane.

Bosket very fine sandy loam, nearly level phase (½ to 3 percent slopes) (Bd).—This soil normally occurs on broad ridges at the higher elevations along old stream runs. Mapped with it are small areas in which the surface layer has a coarser texture than the typical soil.

Soil profile:

A_p 0 to 8 inches, brown (10YR 5/3) very fine sandy loam; weak fine crumb structure; loose when dry, very friable when moist; medium to slightly acid; 6 to 10 inches thick.

B 8 to 20 inches, dark-brown (10YR 4/3) light sandy clay loam or loam; weak, medium subangular blocky structure; slightly hard when dry, friable when moist; medium to slightly acid; 10 to 28 inches thick; clear lower boundary.

C 20 to 40 inches, yellowish-brown (10YR 5/4) fine sandy loam; essentially structureless; loose when dry, very friable when moist; medium to slightly acid.

The color of the surface layer ranges from light brownish gray to brown. That of the B horizon ranges from light yellowish brown to dark brown. Some areas of silty clay loam are included in the B horizon. The texture of the C horizon ranges from very fine sandy loam to loamy sand.

Except in areas in which there is a plowsole, the movement of water into and through the soil is medium. The available moisture-holding capacity is moderate, and the soil contains a moderate supply of plant nutrients. The content of organic matter is low.

Present use and management.—This is one of the best soils in the county for crops that require good drainage. Most of it is used for crops, mainly cotton, corn, and soybeans, but a small acreage is in pasture. On this soil small grains planted in fall for winter grazing and for grain grow well. The soil can be worked under a wide range of moisture conditions. In areas that contain a plowsole, or compacted area, the plowsole should be broken by deep tillage when the soil is dry. The content of organic matter can be increased by turning under sod and cover crops and by incorporating crop residues into the soil. Tillage is best done on the contour, and W-type ditches should be used to provide outlets for the removal of excess surface water. This soil is in capability unit 2 (I–2).

Bosket very fine sandy loam, gently sloping phase (3 to 7 percent slopes) (Be).—This soil includes a few areas that have steeper slopes than typical. In places on the steeper slopes, there are galled spots or small areas that are moderately eroded. Surface runoff is rapid.

The crops grown on this soil are similar to the ones grown on Bosket very fine sandy loam, nearly level phase, and yields are about the same. The rows are best run on the contour to conserve rainfall and to prevent excessive runoff. Grassed waterways are needed in places. This soil is in capability unit 12 (IIIe–2).

Clack Series

In Coahoma County the Clack soils are not mapped separately because they occur in too complex a pattern and the areas are too small. Nevertheless, they are important members of several complexes, namely, the Clack-Bosket, Dundee-Clack, and Sharkey-Clack.

The Clack soils are excessively drained. They have developed from coarse-textured sediments deposited by the Mississippi River. These acid soils occur mainly on old natural levees. In a few places they occur as sandy spots within areas of slack-water clays.

Profile of Clack sandy loam:

A 0 to 8 inches, light yellowish-brown (10YR 6/4) sandy loam; essentially structureless; loose when dry, very friable when moist; medium to strongly acid; 4 to 10 inches thick; clear lower boundary.

Color
B 8 to 16 inches, yellowish-brown (10YR 5/6) loamy sand; essentially structureless; loose; medium to strongly acid; 8 to 10 inches thick; gradual lower boundary.

C 16 to 36 inches+, pale-brown (10YR 6/3) loamy sand; structureless; loose; medium to strongly acid; 18 to 24 inches thick.

The texture of the A horizon ranges from very fine sandy loam to loamy sand; that of the B horizon, from loamy very fine sand to loamy sand; and that of the C horizon, from loamy fine sand to sand.

Water moves rapidly into and through these soils. The available moisture-holding capacity and the content of organic matter are low, and the soils are low in plant nutrients.

Clack-Bosket Soils

This complex consists of well-drained to excessively drained soils that occur in an intricate pattern. The areas are too small and intermingled for it to be practical to map the soils separately. Small patches of Beulah soils are included in the areas.

Clack-Bosket soils, nearly level phases (½ to 3 percent slopes) (Ca).—The profiles of the soils in this complex are similar to those described for the Clack, Bosket, and Beulah series. Surface runoff is slow, and the soils are rapidly permeable. Most of this complex is in pasture. Because the soils are droughty, they are best used for winter grazing. They are in capability unit 26 (VIIs–1).

Commerce Series

The Commerce soils are somewhat poorly drained to moderately well drained. They have formed from medium-textured sediments deposited by the Mississippi River. These soils generally occupy level to nearly level areas on recent natural levees.

These soils have a grayish-brown surface layer of silt loam or silty clay and a stratified subsoil that ranges in texture from very fine sandy loam to silty clay. The soils are too young to show any horizon development.

The Commerce soils make up about 5 percent of the total acreage in the county. They occur mainly in the western part of the county near the Mississippi River. A small acreage lies between the river and its levees. The soils occur in association with the Crevasse, Robinsonville, and Mhoon soils. They are not so well drained as the Crevasse soils and are finer textured. They are not so well drained and have a greater number of mottles than the Robinsonville, and fine-textured material occurs at a shallower depth. They are better drained and have fewer mottles than the Mhoon soils, and fine-textured materials occur at greater depths.

Most areas of Commerce soils are used to grow row crops. The soils are well suited to agriculture; their gentle slopes make them especially desirable for that purpose. The natural vegetation consists of water oak, sugarberry, sweetgum, sweet pecan, sycamore, and a dense undergrowth of vines and cane.

Commerce silt loam, nearly level phase (½ to 3 percent slopes) (Cb).—This soil generally occupies large areas. Small areas, unprotected by levees, are flooded at times.

Soil profile:

A_p 0 to 6 inches, grayish-brown (10YR 5/2) silt loam; weak fine crumb structure; soft when dry, very friable when moist; neutral to mildly alkaline; 4 to 10 inches thick; abrupt lower boundary.

AC 6 to 10 inches, light brownish-gray (10YR 6/2) silt loam; has a few, fine, distinct mottles of reddish brown (5YR 4/4); weak fine crumb or structureless; soft when dry, very friable when moist; neutral to mildly alkaline; gradual lower boundary.

A_b 10 to 22 inches, grayish-brown (10YR 5/2) silt loam with a few, fine, distinct mottles of reddish brown (5YR 4/4); weak fine crumb structure; loose when dry, very friable when moist; neutral to mildly alkaline; gradual lower boundary.

AC_b 22 to 40 inches, light brownish-gray silt loam (10YR 6/2) with a few, fine, distinct mottles of yellowish red (5YR 5/6); weak fine crumb structure to structureless; loose when dry, very friable when moist; neutral to mildly alkaline.

The A_p horizon ranges in color from dark brown to grayish brown. The underlying layers range in texture from very fine sandy loam to silty clay loam and contain thin lenses of finer textured material. Occasionally, the transition is abrupt to beds of slack-water clays.

Except in areas that contain a plowsole, the available moisture-holding capacity is high. The content of organic matter is low.

Mapped with this soil is a small acreage of Commerce very fine sandy loam.

Present use and management.—Almost all of this soil is used to grow row crops, but a small acreage is pastured. The principal crops are cotton, corn, and soybeans. Small grains are grown for early grazing and for grain. These soils respond well to good management, and yields are generally high. In places V-ditches and W-ditches are needed to drain off excess surface water. The content of organic matter can best be increased by growing sod crops and crops that produce litter or by turning under crop residues. Nitrogen is the principal fertilizer needed. Good tilth is easy to maintain. If a plowsole is present, it should be broken by deep tillage. This soil is in capability unit 1 (I–1).

Commerce silt loam, gently sloping phase (3 to 7 percent slopes) (Cc).—This soil is similar to Commerce silt loam, nearly level phase. It has stronger slopes, and about 20 percent of it has a surface layer of very fine sandy loam.

The crops grown on this soil are similar to those grown on Commerce silt loam, nearly level phase, and management is similar. In managing this soil, however, it is important that rows be run so as to help carry off excess runoff water and that the soil be tilled on the contour. In places grassed waterways will be needed. This soil is in capability unit 3 (IIe–1).

Commerce silty clay, level phase (0 to ½ percent slopes) (Cd).—This soil occurs in areas where slack-water clays were deposited over medium-textured recent alluvium. It normally occurs in the areas where coarser textured Commerce soils are transitional to slack-water clays. Surface runoff is slow, and movement of water into the soil is slow.

Most of this soil is used for crops, mainly soybeans and cotton. Tilth is poor because of the heavy surface texture. V-ditches and W-ditches that have adequate outlets are needed to remove excess surface water. The soil also needs organic matter to improve tilth. This soil is in capability unit 19 (IIIw–1).

Commerce silty clay, nearly level phase (½ to 3 percent slopes) (Ce).—This soil has more rapid surface runoff than Commerce silty clay, level phase. A small acreage, unprotected by levees, is flooded occasionally.

The crops grown on this soil are similar to those grown on Commerce silty clay, level phase, and management is similar. Drainage is less of a problem, however, than on Commerce silty clay, level phase. This soil is in capability unit 5 (IIs–2).

Commerce silty clay loam, nearly level phase (½ to 3 percent slopes) (Cg).—This soil is one of the most important of the Commerce soils and makes up about a third of their acreage. Movement of water into this soil is moderately slow. A small acreage, unprotected by levees, is subject to overflow.

Almost all of this soil is in crops. The soil is well suited to cotton and most of the other crops grown locally, and it responds well to good management. It needs minor surface drainage. This can be provided by running the rows so that they will help carry off excess surface water and by providing V-ditches and W-ditches. Tilth can be improved by adding organic matter. This soil is in capability unit 9 (IIs–6).

Commerce silty clay loam, gently sloping phase (3 to 7 percent slopes) (Ch).—Only a small acreage of this soil occurs in the county. The crops grown are similar to those grown on Commerce silty clay loam, nearly level phase, and management is similar. The rows should be run so as to help carry off excess surface water, and grassed outlets may be needed. This soil is in capability unit 13 (IIIe–3).

Crevasse Series

The soils of the Crevasse series are nearly level to gently sloping and are excessively drained. They have developed from coarse-textured recent alluvium. These soils occur at the higher elevations on recent natural levees. They are neutral to mildly alkaline.

Crevasse soils, nearly level phases (½ to 3 percent slopes) (Ck).—These soils occur in the western part of the county near the Mississippi River. They are associated with the Robinsonville, Commerce, and Mhoon soils but differ from those soils in being coarse textured throughout. Except for reaction, they are similar to the Clack soils.

Profile of Crevasse very fine sandy loam:

A 0 to 10 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; weak fine granular structure; loose when dry, very friable when moist; neutral to mildly alkaline; 6 to 14 inches thick; clear lower boundary.

AC 10 to 36 inches, brown (10YR 4/3) to light yellowish-brown (10YR 6/4) loamy fine sand; structureless; loose; neutral to mildly alkaline; 20 to 30 inches thick; gradual lower boundary.

C_g 36 to 42 inches, grayish-brown (10YR 5/2) to light-gray (10YR 7/2) loamy sand; structureless; neutral to mildly alkaline; several feet thick.

The texture of the AC horizon ranges from loamy fine sand to loamy sand, and that of the C_g horizon, from loamy sand to sand.

The available moisture-holding capacity is low; water moves rapidly into and through these soils. The content of organic matter and plant nutrients is low.

Present use and management.—More than one-third of these soils is in forest, which consists mainly of cottonwood and black willow. The rest is used for crops and pasture, although the droughtiness of the soils makes cropping hazardous. The soils are best used for pasture or as woodland. If they are cultivated, early maturing crops should be grown. Small grains for early grazing grow well on these soils. Large amounts of nitrogen are needed, however, and the soils need organic matter to increase the moisture-holding capacity. These soils are in capability unit 26 (VIIs–1).

Dowling Series

The Dowling series consists of poorly drained soils that occur in depressions. The soils have formed mostly from slack-water deposits, but the parent materials included some local alluvium washed down from surrounding soils. The texture is clay or silty clay throughout. The soils are gleyed and are highly mottled. Their reaction ranges from slightly acid to neutral.

These soils make up approximately 15 percent of the total acreage of the county. They are scattered throughout the county and form part of the natural drainage pattern. They occur in association with most of the other soils.

The soils are largely in forest. A small acreage is used for pasture, and the rest, for crops. The soils are poorly suited to agriculture. Surface runoff is slow, and runoff from higher areas tends to collect on them. The natural vegetation consists of cypress, Nuttal oak, tupelo-gum, and willow.

Dowling clay (0 to ½ percent slopes) (Da).—This soil generally occurs in narrow to broad, flat depressions in association with the Sharkey, Alligator, and Forestdale soils. The areas are fairly large and are near swamps.

Soil profile:

A 0 to 4 inches, dark-gray (10YR 4/1) clay; medium and fine granular structure; very hard when dry, very plastic when wet; slightly acid to neutral; 4 to 10 inches thick; clear lower boundary.

C_{11g} 4 to 24 inches, gray (10YR 5/1) clay mottled with gray and brown; weak coarse subangular blocky structure; very hard when dry, very plastic when wet; medium acid to neutral; 10 to 24 inches thick; clear lower boundary.

C_{12g} 24 to 40 inches+, gray (7.5YR 5/0) clay faintly mottled with gray and brown; massive; very hard when dry, very plastic when wet; medium acid to neutral; several feet thick.

In some undisturbed areas there is a thin layer of partly decayed plant residues on the surface. In most places the texture of the surface layer is clay or silty clay.

Water moves into and through this soil very slowly. The available moisture-holding capacity is high, and the supply of plant nutrients is moderate to high. The soil is hard to work, and yields of most crops are low.

Present use and management.—More than 50 percent of this soil is used for crops, principally soybeans and cotton. A small acreage is in pasture, and the rest is still in forest. Unless adequate drainage can be supplied, the use of the soil for crops is hazardous, and flooding makes pasture sods difficult to maintain. The soils can be drained for crops through proper row arrangement and by the use of V-type and W-type ditches with dragline ditches for outlets. Additional nitrogen is needed. This soil is in capability unit 25 (IVw–1).

Dowling soils (0 to ½ percent slopes) (Db).—These poorly drained soils occur in narrow depressions in association with the Dundee, Dubbs, and Forestdale soils. They are similar to Dowling clay, but the texture of the surface layer ranges from silty clay to very fine sandy loam. The textural pattern is so complex that it is difficult to separate the soils of different textures. In places thin layers of coarser material occur in the lower part of the profile.

The principal crops grown on these soils are cotton and soybeans. About 80 percent of the acreage is used for row crops, and yields are slightly higher than on Dowling clay. Nevertheless, unless the soils are drained, their use for cropping is hazardous. Drainage requirements are similar to those needed for Dowling clay. If the Dowling soils are drained, they are usually farmed the same as the surrounding soils. These soils are in capability unit 23 (IIIw–13).

Dubbs Series

The Dubbs soils are moderately well drained to well drained. They have developed from medium-textured Mississippi River sediments. These nearly level to gently sloping soils generally occur at the higher elevations on old natural levees. The subsoil is well oxidized and shows a significant amount of profile development. The soils are medium to slightly acid.

These soils make up approximately 6 percent of the acreage in the county. They are scattered throughout the county and are associated with the Clack, Beulah, Bosket, Dundee, and Forestdale soils. The Dubbs soils are not so well drained as the Clack, Beulah, and Bosket soils, but they have a higher degree of profile development and were derived from finer textured material. They are better drained than the Dundee and Forestdale soils, and the upper part of their profile is comparatively free of mottles.

Almost all of the Dubbs soils are used for crops. They have gentle slopes and are among the most desirable agricultural soils in the county. The natural vegetation is cherrybark oak, sweetgum, water oak, and a dense undergrowth of vines and cane.

Dubbs very fine sandy loam, nearly level phase (½ to 3 percent slopes) (Dd).—This soil makes up almost 90 percent of the Dubbs soils in the county. It occurs on wide ridges.

Soil profile:

A 0 to 8 inches, dark grayish-brown (10YR 4/2) very fine sandy loam; weak fine crumb structure; loose when dry, very friable when moist; medium to slightly acid; 4 to 10 inches thick; clear lower boundary.

B_2 8 to 14 inches, dark-brown (10YR 4/3) sandy clay loam; weak medium subangular blocky structure; slightly hard when dry, friable when moist; medium to slightly acid; clear lower boundary.

B_{22} 14 to 20 inches, brown (10YR 5/3) sandy clay loam; weak medium subangular blocky structure; slightly hard when dry, friable when moist; medium to slightly acid; clear lower boundary.

C_{11} 20 to 30 inches, brown (10YR 5/3) very fine sandy loam; essentially structureless; loose when dry, very friable when moist; medium to slightly acid; clear lower boundary.

C_{12} 30 to 40 inches+, light yellowish-brown (10YR 6/4) very fine sandy loam; structureless; loose when dry, very friable when moist; medium to slightly acid.

The texture of the B horizons ranges from sandy clay to sandy clay loam.

Except in areas where a plowsole occurs below the plow layer, water moves into and through this soil at a moderately rapid rate. The available moisture-holding capacity is moderate, and the soil has a moderate supply of plant nutrients. The content of organic matter is low.

Present use and management.—This is one of the most desirable agricultural soils in the county. Almost all of it is used for crops, but a small acreage is in pasture. This soil is suited to most of the crops commonly grown in the county. Under good management, high yields can be obtained. The soil is easy to work and can be worked under a wide range of moisture conditions. Organic matter will be added to the soil and tilth will be improved by using sod crops and cover crops in the rotation. Nitrogen is the chief fertilizer needed. Where present, the plowsole should be broken by deep tillage when the soil is dry. Rows should be run so as to help remove excess water without causing the soil to erode, and V-type and W-type ditches are needed. This soil is in capability unit 1 (I–1).

Dubbs very fine sandy loam, gently sloping phase (3 to 7 percent slopes) (De).—In most of this soil the surface layer is very fine sandy loam, but in a small acreage the surface layer is silt loam. Surface runoff is rapid. The content of organic matter is low. Crops grown on this soil are similar to those grown on Dubbs very fine sandy loam, nearly level phase, and management is similar. Rows should be run so as to help remove excess water without causing erosion, and V-type and W-type ditches will be needed and grassed outlets may be required. The soil is best planted to close-growing crops most of the time to increase the content of organic matter and to improve tilth. This soil is in capability unit 3 (IIe–1).

Dubbs silt loam, nearly level phase (½ to 3 percent slopes) (Dc).—In this soil, movement of water into the surface layer is a little slower than in Dubbs very fine sandy loam, nearly level phase.

Almost all of this soil is in crops. The crops are similar to those grown on Dubbs very fine sandy loam, nearly level phase, and management is about the same. This soil is in capability unit 1 (I–1).

Dundee Series

The soils of the Dundee series are somewhat poorly drained to moderately well drained and occur on old natural levees. They have developed from medium to moderately fine textured sediments deposited by the Mississippi River. Profile development is stronger in these soils than in the better drained soils of the old natural levee. The soils are medium to strongly acid.

These soils make up approximately 18 percent of the total acreage in the county. They are scattered throughout the county along natural drainageways. The Dundee soils are more strongly developed than the Dubbs soils. They are also more poorly drained and have mottles nearer the surface. They have a browner subsoil and fewer mottles than the Forestdale soils, and they occur at slightly higher elevations.

Almost all the Dundee soils have been used for crops and pasture. The soils are well suited to cultivated crops. The forests consist of winged elm, sweetgum, hickory, red maple, and cherrybark and water oaks.

Dundee very fine sandy loam, nearly level phase (½ to 3 percent slopes) (Do).—This soil occurs in association with the Bosket and Dubbs soils. It occurs at elevations about halfway between those of the Bosket and Dubbs soils and those of the poorly drained Forestdale soils.

Soil profile:

A_p 0 to 5 inches, grayish-brown (10YR 5/2) very fine sandy loam; weak fine granular structure; soft when dry, very friable when moist; medium to strongly acid; abrupt lower boundary.

B_2 5 to 15 inches, grayish-brown (10YR 5/2) sandy clay loam; a few, medium, faint mottles of dark yellowish brown (10YR 4/4); weak medium subangular blocky structure; slightly hard when dry, firm when moist, medium to strongly acid; clear lower boundary.

B_3 15 to 27 inches, light brownish-gray (10YR 6/2) sandy clay loam; a few, medium, prominent mottles of yellowish red (5YR 4/4); weak medium subangular blocky structure; slightly hard when dry, firm when moist; medium to strongly acid; gradual lower boundary.

D 27 to 40 inches+, light brownish-gray (10YR 6/2) very fine sandy loam; common, medium, faint mottles of yellowish brown (10YR 5/6); essentially structureless; loose when dry, very friable when moist; medium to strongly acid.

The B_2 horizon ranges from silty clay to sandy clay loam in texture and from 10 to 24 inches in thickness. Colors range from grayish brown to brown. The B_3 horizon ranges in texture from silty clay loam to sandy clay loam and in color from light grayish brown or light brownish gray to pale brown. The B_3 horizon in places is several feet thick. The texture of the D horizon varies, and this horizon occurs at various depths.

Water moves into this soil at a moderate to moderately slow rate. The available moisture-holding capacity is high. Natural fertility is moderate, and the content of organic matter is low. Surface runoff is medium. The soil has good tilth.

Present use and management.—Most of this soil is used for crops, but a small acreage is in pasture or is used as woodland. Cotton is the principal crop, but the soil is good for most of the crops commonly grown in the area. Under good management high yields can be obtained. The soil is easy to work and can be tilled under a wide range of moisture conditions. In a few places drainage is needed to remove excess surface water. Adequate drainage usually can be supplied by running the rows so that they will carry off excess surface water without causing erosion and by providing V-type and W-type ditches. Organic matter is needed to improve tilth and to increase the available moisture-holding capacity and infiltration. Nitrogen is the chief fertilizer needed. This soil is in capability unit 1 (I–1).

Dundee very fine sandy loam, gently sloping phase (3 to 7 percent slopes) (Dp).—This soil differs from Dundee very fine sandy loam, nearly level phase, mainly in that the thickness of the surface layer is more variable and mottles normally occur at greater depths. Small areas that are moderately eroded are included.

In use and management this soil is similar to Dundee very fine sandy loam, nearly level phase. Rows must be run to reduce runoff, however, and to prevent loss of soil by erosion. It is desirable to keep the soil in sod or close-growing crops as much of the time as feasible. This soil is in capability unit 3 (IIe–1).

Dundee silt loam, nearly level phase (½ to 3 percent slopes) (Dg).—This soil normally occurs at slightly lower elevations than the Dundee very fine sandy loams, and it normally contains more silt throughout. It is among the most desirable soils in the county for crops. The crops are similar to those grown on Dundee very fine sandy loam, nearly level phase. This soil is in capability unit 1 (I–1).

Dundee silt loam, gently sloping phase (3 to 7 percent slopes) (Dh).—Except that the thickness of the surface layer is more variable, this soil is similar to Dundee silt loam, nearly level phase. Small, moderately eroded areas are included. Crops grown on this soil are similar to those grown on Dundee very fine sandy loam, gently sloping phase, and management is about the same. This soil is in capability unit 3 (IIe–1).

Dundee silty clay loam, nearly level phase (½ to 3 percent slopes) (Dm).—This is one of the most important of the Dundee soils. It generally occurs with the Forestdale soils. It differs from Dundee silt loam, nearly level phase, in having a thin surface layer of silty clay loam. Water moves into the soil slowly. The content of organic matter is low, and the soil is fairly easy to work.

This soil is suited to most of the crops commonly grown in the area. Cotton, soybeans, and small grains do well. Under good management moderately high yields can be expected. Surface drainage is needed, and it generally can be provided by W-type ditches and by running the rows so as to remove excess surface water without causing erosion. Additions of organic matter in the form of sod, cover crops, and crop residues will improve tilth. This soil is in capability unit 9 (IIs–6).

Dundee silty clay loam, level phase (0 to ½ percent slopes) (Dk).—This soil is transitional between the lighter textured Dundee soils and the poorly drained Forestdale soils and clay soils of slack-water areas. Surface runoff is slow.

Crops grown on this soil are similar to those grown on Dundee silty clay loam, nearly level phase, and management is similar. Adequate drainage is needed to remove excess surface water. This soil is in capability unit 10 (IIw–1).

Dundee silty clay loam, gently sloping phase (3 to 7 percent slopes) (Dn).—This soil differs from Dundee silt loam, nearly level phase, in having a thin surface layer of silty clay loam and in having steeper slopes. Generally, some small areas are moderately eroded.

Crops grown on this soil are similar to those grown on Dundee silty clay loam, nearly level phase. Management is similar, but this soil needs to have the rows run so as to help check excessive runoff and soil erosion. Additional organic matter from sod, cover crops, and crop residues will improve the tilth and increase the rate that water will infiltrate into the soil. This soil is in capability unit 13 (IIIe–3).

Dundee-Clack Soils

The soils of this complex are somewhat poorly drained to excessively drained. They occur in such complex patterns that it was not practical to map them separately. The Clack and Dundee soils are predominant in the group, but smaller acreages of Beulah, Bosket, and Dubbs soils are included.

The soils of this complex generally occur in the northwestern part of the county. They make up approximately 1 percent of the acreage. Except for small, scattered, droughty areas, the soils are used almost entirely for crops and are fairly well suited to that purpose.

Dundee-Clack soils, gently sloping phases (3 to 7 percent slopes) (Ds).—This is the most extensive of the Dundee-Clack complexes. The profiles of these soils are similar to those described elsewhere in the report for the Dundee, Dubbs, Bosket, Beulah, and Clack soils.

The soils generally are well suited to crops, although in some small areas they tend to be droughty. They are well suited to most of the row crops, grasses, and legumes grown locally, and moderately high yields can be maintained over a long period of time.

The rows should be run so as to help remove excess surface water without causing erosion. Grassed waterways may be needed. If a plowsole is present, it should be broken by deep tillage when the soils are dry. The tilth and general condition of the soils will be greatly improved by growing sod or cover crops as often as practical. These soils are in capability unit 16 (IIIs–1).

Dundee-Clack soils, nearly level phases (½ to 3 percent slopes) (Dr).—Crops grown on this complex are similar to those grown on Dundee-Clack soils, gently sloping phases. Also management is about the same, but excessive runoff is less of a problem. In some places surface drainage in the form of V-type and W-type ditches may be needed. This complex is in capability unit 4 (IIs–1).

Dundee-Clack soils, sloping phases (7 to 10 percent slopes) (Dt).—The soils of this complex have fairly steep slopes. They occur inside the meanders of old stream runs.

These soils should be planted to sod or close-growing crops as much of the time as feasible. If cotton and other row crops are grown, water runs off the soils before it can penetrate deep into the soil. This causes losses of soil through erosion, and the soils become droughty. This complex is in capability unit 24 (IVe–3).

Forestdale Series

The Forestdale soils are somewhat poorly drained to poorly drained. They are developing in old alluvium deposited by the Mississippi River. The soils are predominantly nearly level, but relief ranges from level to gently sloping. The soils occur on old natural levees throughout the county.

The surface layer of these soils is grayish. The subsoil is pale brown or light gray and is highly mottled. It overlies a substratum of gray silty clay loam. The soils are medium to strongly acid throughout.

The Forestdale soils occupy approximately 11 percent of the acreage in the county. They occur with the Dubbs, Dundee, Dowling, and Alligator soils. The soils are not so well drained as the Dubbs and Dundee soils. Their profile is more highly developed than that of the Alligator soils, and the soils are stratified and have a slightly coarser texture. They differ from the Dowling soils in that the Dowling soils occur in depressions.

A large part of the Forestdale acreage is used for crops. Management is a problem, however, because internal drainage is slow. The natural forests consist of hardwoods and a dense undergrowth of brush and vines.

Forestdale silty clay loam, nearly level phase (½ to 3 percent slopes) (Fh).—This soil is poorly drained and is medium acid. It is nearly level.

Soil profile:

A_p 0 to 5 inches, light brownish-gray (10YR 6/2) silty clay loam; weak granular structure; slightly hard when dry, friable when moist; medium acid; 4 to 8 inches thick; clear lower boundary.

B_{2g} 5 to 24 inches, light-gray (10YR 7/2) silty clay mottled with strong brown (7.5YR 5/8); medium subangular blocky structure; hard when dry, firm when moist; medium acid; 12 to 19 inches thick; clear lower boundary.

B_{3g} 24 to 31 inches, light-gray (10YR 7/2) silty clay loam mottled with strong brown (7.5YR 5/8); weak medium subangular blocky structure; hard when dry, friable when moist; medium acid; 6 to 12 inches thick; clear lower boundary.

C_g 31 to 40 inches, light-gray (10YR 7/2) silty clay loam mottled with reddish yellow (7.5YR 6/8) structureless; slightly hard when dry, friable when moist; medium acid.

The texture of the A_p horizon ranges from silt loam to silty clay. The color of the B horizons ranges from pale brown to light gray. In places the texture of the C_g horizon is sandy clay loam.

Water moves slowly into and through this soil, and the available moisture-holding capacity is high to very high. The content of organic matter is low. Tilth is poor.

Present use and management.—About 90 percent of this soil is used to grow soybeans, cotton, small grains, rice, and other crops. The soils are poorly suited to corn and alfalfa, but they are well suited to bermudagrass and legumes. They are somewhat difficult to work, and cultivation is often delayed after rains. Drainage through V-type and W-type ditches is needed to remove excess surface water. Nitrogen is normally the only fertilizer needed. Organic matter from sod and crop residues helps to improve the general condition and tilth of the soil. This soil is in capability unit 7 (IIs–4).

Forestdale silty clay loam, level phase (0 to ½ percent slopes) (Fg).—This soil occurs near the bases of old natural levees. Surface drainage is difficult because runoff from higher lying areas tends to collect on the soil.

Except for cotton, the crops grown on this soil are similar to those grown on Forestdale silty clay loam, nearly level phase, and management is about the same. The soils are not well suited to cotton. Planting and cultivating are often delayed after periods of rainfall. The soil must be drained. V-type and W-type ditches that empty into larger ditches will help to provide drainage. Rows run so as to help remove excess water without causing erosion will also help. This soil is in capability unit 21 (IIIw–5).

Forestdale silty clay loam, gently sloping phase (3 to 7 percent slopes) (Fk).—This soil occurs in narrow strips that border depressions. It has an occasional galled spot where the surface layer has become eroded.

Crops on this soil are similar to those grown on Forestdale silty clay loam, nearly level phase, and management is about the same. Rows should be arranged so as to help remove excess surface water without causing erosion. Grassed outlets may be needed. This soil is in capability unit 14 (IIIe–5).

Forestdale silt loam, level phase (0 to ½ percent slopes) (Fa).—Small areas in which the surface texture is very fine sandy loam are mapped with this soil. Water moves into the surface layer at a moderately slow rate.

This soil is used to grow soybeans, small grains, rice, and winter cover crops. Cotton is also grown, but the soil is not well suited to it. The soil needs drainage to remove excess surface water. Deep furrows and the use of high beds will help to drain and aerate the soil. Nitrogen is usually the only fertilizer needed. This soil is in capability unit 20 (IIIw–3).

Forestdale silt loam, nearly level phase (½ to 3 percent slopes) (Fb).—Small areas in which the surface texture is very fine sandy loam and some areas in which the slopes are gentle are mapped with this soil. Most of this soil is used for row crops. The crops are similar to those grown on Forestdale silt loam, level phase, and management is about the same. Additions of organic matter are needed to improve the tilth and general condition of the soil. This soil is in capability unit 6 (IIs–3).

Forestdale silty clay, nearly level phase (½ to 3 percent slopes) (Fd).—This soil generally occurs at the higher elevations in slack-water areas. It is associated with the Alligator soils. Except during dry spells, water moves slowly into and through the soil. In dry weather the soil cracks extensively. The available moisture-holding capacity is moderate, and the content of organic matter is low. The soil has poor tilth.

Most of this soil is used for crops. The principal crops are cotton and soybeans, but in recent years a large acreage has been used for pasture and rice, to which the soil is well suited. Corn is an uncertain crop on this soil. The yields of most other crops grown locally are moderately high if the weather is favorable and the soil is well managed.

Organic matter is needed to improve the general condition of the soil and to make it easier to work. This can best be added by turning under sod crops and cover crops. Surface drainage is essential, but V-type and W-type ditches will usually be adequate. Nitrogen is the main fertilizer needed. This soil is in capability unit 18 (IIIs–4).

Forestdale silty clay, level phase (0 to ½ percent slopes) (Fc).—This soil generally occurs in low, level areas in association with the slack-water clays. Surface runoff is slow.

Most of this soil is in crops. The crops are similar to those grown on Forestdale silty clay, nearly level phase, and management is about the same. Cropping is hazardous, however, unless the soil is drained extensively. Drainage by V-type and W-type ditches that empty into larger drains is usually adequate. This soil is in capability unit 22 (IIIw–11).

Forestdale silty clay, gently sloping phase (3 to 7 percent slopes) (Fe).—This soil generally occurs in narrow strips along old stream runs. Surface runoff is rapid.

Almost all of this soil is used for crops, principally cotton, soybeans, and small grains. The soil is well suited to pasture and to close-growing crops. Rows should be arranged so as to remove excess surface water without causing erosion. Grassed outlets may be necessary. Additions of organic matter will make the soil easier to work. This soil is in capability unit 15 (IIIe–6).

Mhoon Series

The Mhoon soils are poorly drained to somewhat poorly drained and are level to nearly level. They occur at the lower elevations on recent natural levees. These soils have a surface soil of very dark grayish-brown silty clay that overlies a highly mottled, grayish-brown subsoil of variable texture. Normally, the water table is high.

Less than 1 percent of the acreage in Coahoma County is made up of Mhoon soils. These soils occur in the northern part of the county. A small acreage is located behind the levees and is subject to periodic overflows of long duration. These soils are associated with the Crevasse, Robinsonville, and Commerce soils. They occur at lower elevations than the associated soils, have poor drainage, and have large amounts of fine-textured material in the profile.

Most of the Mhoon soils are used for crops, principally soybeans and cotton. Poor tilth and the problem of providing adequate surface drainage make them very difficult to manage. The natural forest cover consists of hardwoods and a dense undergrowth of brush and vines.

Mhoon silty clay, nearly level phase (½ to 3 percent slopes) (Ma).—This soil occurs in the northern part of the county. Some small areas are flooded occasionally.

Soil profile:

A_p 0 to 5 inches, very dark grayish-brown (10YR 3/2) silty clay; weak fine granular structure; hard when dry, very plastic when wet; neutral to mildly alkaline; 4 to 8 inches thick; abrupt lower boundary.

C_{21g} 5 to 27 inches, dark grayish-brown (10YR 4/2) silty clay; common, medium, distinct mottles of strong brown (7.5YR 5/6); essentially structureless; very hard when dry, plastic when wet; neutral to mildly alkaline; 12 to 24 inches thick; clear lower boundary.

C_{22g} 27 to 40 inches, dark-gray (10YR 4/1) silty clay loam; common, medium, distinct mottles of dark brown (7.5YR 4/4); structureless; slightly hard when dry, friable when moist; neutral to mildly alkaline.

The C_{21g} horizon ranges in texture from silt loam to silty clay. In many places it consists of thin lenses of medium- to coarse-textured materials. The C_{22g} horizon also varies in texture.

Surface runoff is slow, and water moves slowly into and through the profile. The available moisture-holding capacity is moderate. The soil is difficult to work, but it has a good supply of plant nutrients.

Present use and management.—The principal crops on this soil are soybeans and cotton. The soil is well suited to pasture. Drainage is needed if crops are to be grown. This generally can be supplied in the form of rows arranged to remove excess water without causing erosion and by using V-type and W-type ditches that empty into larger ditches. The soil needs additional organic matter to improve the tilth. It is in capability unit 18 (IIIs–4).

Robinsonville Series

The Robinsonville soils are moderately well drained to well drained. They have developed from fresh, medium-textured alluvium deposited by the Mississippi River. They are nearly level to gently sloping and occur on the natural levees of streams that have recently been active.

The surface layer is pale-brown to dark yellowish-brown very fine sandy loam that overlies yellowish-brown silt loam or very fine sandy loam. This is underlain by stratified material that ranges from sand to silty clay.

These soils make up approximately 1 percent of the acreage in the county. They occur in the northwestern part of the county, near the Mississippi River, in association with the Crevasse and Commerce soils. The soils differ from the Crevasse soils in being derived from medium-textured materials. They are better drained and less mottled than the Commerce soils.

The Robinsonville soils are generally used to grow crops. They are among the most desirable agricultural soils in the county because of their good tilth and gentle slopes. The native vegetation consists of hardwoods with an undergrowth of vines and cane.

Robinsonville very fine sandy loam, nearly level phase (½ to 3 percent slopes) (Ra).—This soil normally occurs in fairly large areas. A small acreage, not protected by levees, is subject to overflow.

Soil profile:

A 0 to 8 inches, dark yellowish-brown (10YR 4/4) very fine sandy loam; weak fine crumb structure; soft when dry, very friable when moist; neutral to mildly alkaline; 4 to 10 inches thick; clear lower boundary.

AC_1 8 to 14 inches, very dark grayish-brown (10YR 3/2) silt loam or very fine sandy loam; essentially structureless but tends toward weak medium subangular blocky structure; soft when dry, very friable when moist; neutral to mildly alkaline; 4 to 6 inches thick; clear lower boundary.

C_{21} 14 to 36 inches, yellowish-brown (10YR 5/4) fine sandy loam; essentially structureless; loose when dry, very friable when moist; neutral to mildly alkaline; 10 to 30 inches thick; clear lower boundary.

C_{22} 36 to 40 inches+, light yellowish-brown (10YR 6/4) loamy sand with a few, fine, faint discolorations; structureless; loose; neutral to mildly alkaline.

The AC_1 horizon is absent in some places. This layer may have become compacted as the result of farm machinery being run over the soil. The texture of the C_{21} horizon ranges from silt loam to fine sandy loam, and that of the C_{22} horizon, from loamy sand to sandy clay loam. In some places the C_{22} horizon occurs at a greater depth than in the typical profile.

Except where a plowsole is present, water moves through this soil at a moderate to moderately rapid rate. The available moisture-holding capacity is moderate. The soil is easy to work, and it has good surface drainage. It has a good natural supply of plant nutrients, but the content of organic matter is low.

Present use and management.—This is among the best agricultural soils in the county. It is well suited to cotton, corn, soybeans, small grains, and most of the crops grown locally. It also is good for early grazing. Under good management the yields of most crops are high. This soil can be worked under a wide range of moisture conditions. The available moisture-holding capacity and the general tilth of the soil can be improved by adding organic matter. This can best be done by using sod crops, close-growing crops, and legumes in the rotation and by returning crop residues to the soil. If a plowsole is present, it can be broken by deep tillage when the soil is dry. Nitrogen is needed in the soil. Rows run to help remove excess water without causing erosion, along with V-type and W-type ditches, will normally provide adequate drainage. This soil is in capability unit 2 (I–2).

Robinsonville very fine sandy loam, gently sloping phase (3 to 7 percent slopes) (Rb).—This soil occurs in long, narrow strips along streams. The crops grown on this soil are similar to those grown on Robinsonville very fine sandy loam, nearly level phase, and the management is essentially the same. The soil needs to have the rows run so as to help remove excess water without causing erosion; V-type and W-type ditches are required to reduce surface runoff and erosion. Vegetated waterways are needed in places. Special effort should be made to increase the organic content of the soil. This soil is in capability unit 12 (IIIe–2).

Robinsonville-Crevasse Soils

The soils of these complexes are moderately well drained to excessively drained. They occur in such an intricate pattern that it was not practical to map them separately. The complexes occur only in the western part of the county near the Mississippi River. Although they are limited in extent, locally the soils are important for agriculture.

Robinsonville-Crevasse soils, nearly level phases (½ to 3 percent slopes) (Rc).—Profiles of the Robinsonville and Crevasse soils have been described elsewhere in the report. The dominant characteristics of the soils are similar to those of the Robinsonville soils. A small acreage, unprotected by levees, is subject to overflow.

These soils are used and managed in about the same way as Robinsonville very fine sandy loam, nearly level phase. During periods of dry weather, crops on the areas that consist predominantly of Crevasse soils are generally affected by lack of moisture. This complex is in capability unit 4 (IIs–1).

Robinsonville-Crevasse soils, gently sloping phases (3 to 7 percent slopes) (Rd).—Crops on soils of this complex are similar to those grown on Robinsonville very fine sandy loam, gently sloping phase, and the soils need about the same management. During dry weather, crops on the areas of Crevasse soils are generally affected by lack of moisture. These soils are in capability unit 16 (IIIs–1).

Sharkey Series

The Sharkey series consists of dark-colored, poorly drained, slack-water clays that have developed from fine-textured alluvium deposited by the Mississippi River. Locally, they are called buckshot soils. They are predominantly level to nearly level, but some areas are gently sloping. The surface layer is generally very dark grayish-brown clay. It overlies a dark-gray subsoil of clay that is conspicuously mottled with brown and yellow. When dry, these soils contract and crack extensively. When wet, they expand and the cracks seal over.

These soils occupy approximately 10 percent of the acreage in the county. They occur mostly in the western half of the county, where they are associated with the Alligator, Tunica, and Mhoon soils. The Sharkey soils are darker throughout than the Alligator soils. They differ from the Tunica soils in being poorly drained and in consisting of a thicker layer of slack-water clay. These soils are slightly acid to neutral. In contrast, the Mhoon soils are alkaline. Also the Sharkey soils are not stratified, as are the Mhoon, and they consist of clay instead of the sand, silt, and clay of the Mhoon soils.

Most of the Sharkey acreage is in crops. However, these clayey soils that need surface drainage are difficult to manage. The forest cover consists of green ash, American elm, hackberry, red maple, bitter pecan, sweetgum, and various kinds of water-tolerant oaks. There is a dense undergrowth of brush and vines under the trees.

Sharkey clay, nearly level phase (½ to 3 percent slopes) (Sb).—This soil occurs at the higher elevations in areas of other Sharkey clays. In many places it occurs on a ridge-and-depression type of topography. A small acreage that is unprotected by the levee is subject to overflow.

Soil profile:

A_g 0 to 4 inches, very dark grayish-brown (10YR 3/2) clay; weak fine granular structure; very hard when dry, plastic when wet; slightly acid to neutral; 2 to 6 inches thick; abrupt lower boundary.

AC_g 4 to 24 inches, dark-gray (10YR 4/1) clay with common, medium, faint mottles of dark yellowish-brown (10YR 4/4); weak coarse blocky structure; very hard when dry, very plastic when wet; slightly acid to neutral; 10 to 30 inches thick; gradual lower boundary.

C_g 24 to 40 inches+, dark-gray (10YR 4/1) clay with many, medium, faint mottles of dark yellowish-brown (10YR 4/4); massive; very hard when dry, very plastic when wet; slightly acid to neutral.

The A_g and AC_g horizons range from very dark grayish brown to dark gray. In places the C_g horizon is gray or light gray. Water moves into and through the profile very slowly, except when the soil is cracked. Then the soil absorbs water rapidly until the cracks seal. The available moisture-holding capacity is very high, and the soil is difficult to work. Surface drainage is slow.

Present use and management.—More than 80 percent of this soil is used for cultivated crops, principally soybeans and cotton. Recently, a fairly large acreage has been planted to pasture and rice, to which the soil is well suited. Under good management, if weather is favorable, yields of cotton are generally high. Corn, however, is an uncertain crop. This soil is difficult to manage. It remains wet for long periods after rains and is extremely hard during droughts. Adequate surface drainage in the form of V-type and W-type ditches is essential. The tilth and the general condition of the soil can be improved by growing sod and cover crops, and by turning under crop residues. This soil is in capability unit 18 (IIIs–4).

Sharkey clay, level phase (0 to ½ percent slopes) (Sa).—This soil occurs at the lower elevations in areas of other Sharkey clays. It differs from Sharkey clay, nearly level phase, mostly in having a darker surface layer and in being more gleyed. Surface drainage is very slow. If the soil is not adequately drained, surface runoff from higher lying areas tends to collect on it and it remains ponded for long periods of time.

More than 70 percent of this soil is cultivated. Crops to which it is suited are about the same as those grown on Sharkey clay, nearly level phase. Cotton, however, is a very uncertain crop because of poor drainage, but pastures do well. This soil must be drained adequately before most of the local crops can be grown. In places dragline ditches are needed. This soil is in capability unit 22 (IIIw–11).

Sharkey clay, gently sloping phase (3 to 7 percent slopes) (Sd).—This soil occurs in long, narrow strips along the edges of depressions or stream runs. It is similar to Sharkey clay, nearly level phase, except that it has a thin surface layer. Surface runoff is rapid.

This soil is best used for pasture or for close-growing crops. It is also well suited to cotton and soybeans. If row crops are grown, rows should be arranged so as to help remove excess water without causing erosion. Additions of organic matter will improve the tilth of this soil. The soil is in capability unit 15 (IIIe–6).

Sharkey clay, nearly level phase, shallow over sand (½ to 3 percent slopes) (Sc).—This soil resembles Sharkey clay, nearly level phase, closely but differs in that it overlies coarse river sand at a depth of about 20 inches. It normally occurs near broad depressions that once were old river channels but are now occupied by Dowling clay. This soil generally occurs in the southwestern part of the county. The available moisture-holding capacity is lower than that of Sharkey clay, nearly level phase.

Although this soil is fine textured, it is somewhat droughty. The chief crops grown on it are cotton, soybeans, small grains, grasses, and legumes. Rice is an uncertain crop. This soil is in capability unit 5 (IIs–2).

Sharkey silty clay, nearly level phase (½ to 3 percent slopes) (Sh).—A small acreage in which the surface layer is silty clay loam is mapped with this soil. The crops grown on this soil are similar to those grown on Sharkey clay, nearly level phase, and management is about the same. This soil is in capability unit 18 (IIIs–4).

Sharkey silty clay, level phase (0 to ½ percent slopes) (Sg).—Small areas that have a surface layer of silty clay loam are mapped with this soil. About the same crops are grown on this soil as on Sharkey clay, level phase, and management is about the same. This soil is in capability unit 22 (IIIw–11).

Sharkey silty clay, gently sloping phase (3 to 7 percent slopes) (Sk).—This soil is similar to Sharkey clay, gently sloping phase, except for the texture of the surface layer. It also is managed in about the same way. Some areas are moderately eroded. This soil is in capability unit 15 (IIIe–6).

Sharkey silt loam, nearly level overwash phase (½ to 3 percent slopes) (Se).—This soil occurs in an area that is transitional between the soils of the natural levees and the slack-water clays. It has developed as the result of two different types of flooding: The clayey part of the profile was deposited by slowly moving waters or slack waters, but the surface layer of silt loam was deposited later by fast-moving waters that formed the natural levees. This soil also occurs at the base of natural levees where medium-textured material washed or sloughed down on Sharkey clay. The surface layer of silt loam ranges from 6 to 20 inches in thickness. It overlies dark-colored clay of slack-water origin.

Surface runoff is medium and internal drainage is slow. Permeability is moderately slow. The content of organic matter is low. A small acreage that has a surface layer of very fine sandy loam is included in areas of this soil.

This soil is generally used to grow cotton, corn, and soybeans. Under good management, moderately high crop yields can be obtained over long periods of time. Surface drainage is generally required, and organic matter is needed. Nitrogen is the chief fertilizer needed. This soil is in capability unit 8 (IIs–5).

Sharkey-Clack Soils

The Sharkey-Clack complexes consist of Sharkey, Clack, Beulah, Bosket, and Dundee soils, intermingled in such intricate patterns that it was not practical to map each one separately. The Sharkey and Clack are the predominant soils in the complexes. The texture ranges from sand to clay. Internal drainage ranges from very slow to very rapid.

This complex occurs largely in the southwestern part of the county. The areas are fairly large, and the soils are important for agriculture.

Sharkey-Clack soils, nearly level phases (½ to 3 percent slopes) (Sm).—The soils of this complex vary in kind of profile and in other characteristics. They are difficult to manage because of the wide variations in texture and drainage. The soils are used principally to grow cotton and small grains. Generally, they are droughty. Crops should be planted early in the growing season because there is more moisture at that time. The soils are well suited to forage crops. They are in capability unit 18 (IIIs–4).

Sharkey-Clack soils, gently sloping phases (3 to 7 percent slopes) (Sn).—These soils normally occur in long, narrow strips along streams and bayous. The crops grown on them are about the same as those grown on Sharkey-Clack soils, nearly level phases, and management is about the same. If the soils are planted to row crops, the rows should be arranged so as to remove excess water without causing erosion. Vegetated outlets may be required. The soils are in capability unit 15 (IIIe–6).

Souva Series

The Souva soils are somewhat poorly drained. They occur in narrow depressions that are scattered over the natural levees. They have developed from medium-textured material that has washed or sloughed down from the better drained soils of the natural levees. The surface layer is dark grayish-brown silt loam that overlies a mottled brown subsoil of silty clay loam. These soils are medium acid to neutral.

These soils are associated with the Beulah, Bosket, Dubbs, and Robinsonville soils. The Souva soils differ from the associated soils in that they occur in depressions. They are the best depressional soils in the county for crops, and most of the acreage is used for that purpose. Crops are uncertain, however, unless drainage is adequate.

Souva silt loam (0 to ½ percent slopes) (So).—This somewhat poorly drained soil is the only Souva soil mapped in the county.

Soil profile:

A_p 0 to 5 inches, dark grayish-brown (10YR 4/2) silt loam; weak fine granular structure; soft when dry; very friable when moist; medium acid; 5 to 14 inches thick; abrupt lower boundary.

C_{11} 5 to 17 inches, brown (10YR 5/3) silty clay loam with common, medium, prominent mottles of yellowish red (5YR 4/6); weak fine subangular blocky structure; slightly hard when dry, friable when moist; medium acid; gradual lower boundary.

C_{12} 17 to 28 inches, brown (10YR 5/3) silty clay loam with common, medium, faint mottles of yellowish brown (10YR 5/6); weak fine granular structure; slightly hard when dry, friable when moist; medium acid; gradual lower boundary.

C_{13} 28 to 40 inches, pale-brown (10YR 6/3) silt loam with a few, fine, faint mottles of yellowish brown (10YR 5/6); weak fine subangular blocky structure; soft when dry, very friable when moist; slightly acid.

The A_p horizon ranges in texture from silty clay loam to very fine sandy loam. The combined thickness of the C_{11} and C_{12} horizons ranges from 10 to 24 inches. The texture of the C_{13} horizon, in many places, is a gleyed silty clay. Unless this soil is drained, the water table is often high. If it is drained, water moves into and through the soil at a moderate rate. The soil is fairly easy to work, and the content of organic matter is fairly high.

Present use and management.—Most of this soil is used for crops, principally cotton or corn. If row crops are grown, drainage is needed through rows that remove excess water without causing erosion and through V- and W-type ditches. After this soil is drained, it is managed in about the same way as the surrounding soils. The areas of this soil are so small that drainage is not always practical unless the nearby soils also benefit. This soil is in capability unit 11 (IIw–3).

Tunica Series

The Tunica soils are somewhat poorly drained. They have developed from slack-water clays deposited by the Mississippi River. They occur at high elevations in slack-water areas and on nearly level to gently sloping topography.

The surface layer is a thin, dark grayish-brown clay that overlies a subsoil of dark-gray or olive-brown clay. This is underlain, at depths of 20 to 30 inches, by well-drained silty clay loam or silt loam. These soils crack extensively when dry and seal over when wet. They are slightly acid to neutral.

Approximately 2 percent of the acreage in the county is made up of Tunica soils. These soils occur mostly in the western part of the county. They are associated with Sharkey and Alligator soils. They differ from the associated soils in being underlain by coarser textured material. In addition they are darker colored than the Alligator soils.

Most of the acreage of Tunica soils is cultivated. Gentle slopes and medium internal drainage make these soils more suitable for crops than the other soils of the slack-water areas. The natural vegetation consists of hardwoods with an undergrowth of vines and cane.

Tunica silty clay, nearly level phase (½ to 3 percent slopes) (Ta).—This soil normally occurs in narrow bands along depressions and bayous. Some areas that have a surface layer of clay are included.

Soil profile:

A_p 0 to 4 inches, dark grayish-brown (10YR 4/2) silty clay; weak fine granular structure; very hard when dry, very plastic when wet; neutral; 2 to 8 inches thick; abrupt lower boundary.

C 4 to 20 inches, dark-gray (10YR 4/1) silty clay; weak medium subangular blocky structure; very hard when dry, very plastic when wet; neutral; 20 to 30 inches thick; abrupt lower boundary.

D_1 20 to 26 inches, grayish-brown (10YR 5/2) silty clay loam with a few, medium, faint mottles of dark yellowish brown (10YR 4/4); essentially structureless with a tendency toward weak fine subangular blocky structure; slightly hard when dry, friable when moist; neutral; up to several feet thick; gradual lower boundary.

D_2 26 to 40 inches, dark-brown (10YR 4/3) silt loam with common, fine, faint mottles of dark yellowish brown (10YR 4/4); structureless; soft when dry, very friable when moist; slightly acid.

The D_1 horizon is several feet thick in places, and it ranges in texture from very fine sandy loam to silty clay loam.

Water moves into and through this soil slowly. If the soil is dry and cracked, it absorbs water rapidly until the cracks fill up. The available moisture-holding capacity is very high to high, and the supply of plant nutrients is moderate. This soil is difficult to work.

Present use and management.—Almost all of this soil is in crops, principally cotton, soybeans, and small grains. A small acreage is used for pasture. Yields of crops are moderate, but under special management they may be high. The soil is difficult to work, and it can be worked only within a narrow range of moisture content. Additions of organic matter, however, in the form of sod, cover crops, or crop residues will help to improve the tilth. Generally, limited surface drainage is needed. Nitrogen is the chief fertilizer required. This soil is in capability unit 5 (IIs–2).

Tunica silty clay, gently sloping phase (3 to 7 percent slopes) (Tb).—This soil generally occurs on the gently sloping banks of bayous. In many places small areas that are moderately eroded are included. Most of this soil is used to grow cotton, soybeans, and small grains. Management is about the same as for Tunica silty clay, nearly level phase. Row arrangement that helps remove excess water without causing erosion is needed, and in places vegetated waterways may be required. This soil is in capability unit 17 (IIIs–2).

Genesis, Morphology, and Classification of Soils[3]

Factors of Soil Formation

Soils are the result of five major factors—climate; living organisms; parent material; topography (or physiography, relief, and drainage); and time. All five factors take part in the formation of the soil, but various ones dominate over the others. In general, the most evident differences between the soils of two distant areas are probably caused by differences in the climate and type of native vegetation. Differences between adjacent soils in a small area are probably caused by differences in the parent material or in the topographic position.

The soils of Coahoma County differ from those of upland counties adjacent to the Delta chiefly because of differences in age. They differ partly because of differences in topography and drainage. Within the county differences in age, topography, and kind of alluvium upon which they were formed account for most of the differences among the soils.

In this section, the factors most important in forming soils are described, as well as the role of each in determining the broad patterns of soil distribution.

Climate

The climate of Coahoma County is of the humid, warm-temperate, and continental type. Winters are mild and generally have short periods of freezing weather. Summers are fairly hot, and occasionally the temperatures are more than 100° F. Normal average temperatures and rainfall for the county are given in table 7.

[3] Part of the material in this section was taken, with modification, from the Soil Survey of Tunica County, Miss.

The growing season for crops is about 217 days, or from March 28 until October 31. All crops common to this area are grown. The average annual rainfall is almost 50 inches a year. Farm operations are restricted to some extent in most years because of the wet weather in spring.

Normally, soils in a climate such as this are highly weathered and acid, and they have a low supply of plant nutrients. However, these soils are of geologically recent origin. They have not had time to develop so much as some of the soils of the uplands of central Mississippi, for example.

TABLE 7.—*Temperature and precipitation at Clarksdale, Coahoma County, Miss.*

[Elevation, 177 feet]

Month	Temperature [1]			Precipitation [2]			
	Average	Absolute maximum	Absolute minimum	Average	Driest year (1954)	Wettest year (1923)	Average snowfall
	° F.	° F.	° F.	Inches	Inches	Inches	Inches
December	45. 8	80	3	5. 16	3. 24	7. 63	0. 5
January	44. 2	80	−8	4. 64	5. 61	5. 00	1. 5
February	47. 4	84	0	4. 18	1. 98	5. 16	. 7
Winter	45. 8	84	−8	13. 98	10. 83	17. 79	2. 7
March	55. 5	89	13	5. 56	1. 32	7. 09	. 3
April	63. 6	94	29	4. 74	4. 59	8. 83	(3)
May	71. 3	101	34	4. 89	4. 80	10. 03	0
Spring	63. 5	101	13	15. 19	10. 71	25. 95	. 3
June	79. 5	107	48	3. 77	2. 13	5. 38	(3)
July	81. 9	108	53	3. 24	2. 04	3. 79	0
August	81. 3	109	52	3. 36	. 30	3. 69	0
Summer	80. 9	109	48	10. 37	4. 47	12. 86	(3)
September	76. 1	107	36	2. 62	. 47	. 88	0
October	64. 6	97	26	2. 87	1. 57	4. 82	0
November	53. 3	87	13	4. 01	1. 99	3. 42	. 2
Fall	64. 7	107	13	9. 50	4. 03	9. 12	. 2
Year	63. 7	109	−8	49. 04	30. 04	65. 72	3. 2

[1] Average temperature based on a 49-year record, through 1955; highest temperature based on a 46-year record, and lowest temperature, on a 47-year record, through 1952.

[2] Average precipitation based on a 51-year record, through 1955; wettest and driest years based on a 46-year record, in the period 1893–1955; snowfall based on a 48-year record, through 1952.

[3] Trace.

Living organisms

When the first settlements were made, the county was covered entirely by forests and canebrakes. Except for the swampy areas that had dense stands of cypress, most of the trees were hardwoods. At the higher elevations were hickory, pecan, blackgum, winged elm, post oak, and water oak. At the lower elevations, where water remained most of the year, were tupelo-gum, soft elm, maple, green ash, hackberry, cottonwood, sweetgum, overcup oak, and willow oak. Tall and luxuriant stands of cane grew in the broad flats between the bayous and sloughs.

In general, differences in the native vegetation are associated with differences in drainage. None of the differences among the soils of the county can be attributed solely to the differences in the natural vegetation.

Some of the soils formed on the most recent deposits, such as the Commerce and Robinsonville, have been cultivated for almost the entire period since the parent alluvium was deposited by the river.

Man has influenced the formation of the soils in the county. The system of levees and the drainage activities associated with it have placed the soils of the county in an environment that differs greatly from that before the county was settled. Some of the effects of this change are important in the soils at the present time. Others may not be apparent for several centuries.

Parent material

Sediments carried by the Mississippi River are made up of many kinds of minerals. Since the drainage area above the county includes some 30 States and extends from Montana to Kentucky, practically every type of mineral is picked up by the water. Many of the minerals carried by the river are still fresh and unweathered, since a large part of the watershed to the north of the county is covered by glacial deposits of fairly recent geologic age. Also, many sources of old and highly weathered minerals are in parts of the Appalachian Mountains and the Cumberland Plateau that are drained by tributaries of the Mississippi River. This wide range in the sources of sediments has resulted in an equally wide range of minerals in the parent materials of the soils in the county.

As these sediments are dropped by moving water, the largest and heaviest pieces drop out first. Thus, large particles of sand are deposited by rapidly moving water. As the speed of the water decreases, finer particles settle out, and as the floodwaters spread out over a river valley and flow more slowly, the silts and finally the clays are deposited on the valley floor. Since clays are the finest particles and settle at a slow rate in the water, extensive deposits of clay generally occur in areas of slack water.

The nature of the parent material at any one place in the county is therefore the result of a thorough mixing of minerals in the river and its tributaries, plus a partial separation of the particles in this mixture that is brought about by the differences in the rate of flow of the floodwaters. Thus, for the soils of the county, there is a relationship between the parent material, topography, and drainage. On the higher spots close to the natural levees, the soils have formed from sandy parent materials. The low places in the slack-water areas are usually filled with clay.

Physiography, relief, and drainage

The county is mostly level or nearly level. Nevertheless, in places the surface is broken by former stream channels or other depressions, or by low ridges, or the natural levees along streambanks. These minor irregularities, however, seldom interfere with tillage. The areas of highest elevation are along the banks of streams and old stream beds. They occur in the northwestern part of the county where the elevation, in places, is 182 feet above sea level. The slope is gradual toward the east and south. In the southern part of the county, the elevation is 145 feet.

The drainage of the county is generally toward the southeast. Streams normally flow away from the Mississippi River instead of toward it. The area is drained by a network of sluggish streams that have their origin within the county.

Although many streams flow through the county, large areas are poorly drained because the land along the streams has been built up to form natural levees that prevent floodwaters from draining back into the streams. Also, many small streams are obstructed by logs, brush, and other debris that retard drainage. Large sections of the county have been set aside as drainage ditches to help reclaim the poorly drained, slack-water areas. Many extensive areas, formerly flooded much of the year, have been brought under cultivation by extending canals into bayous and clearing the bayous of logs and stumps.

Before 1850, little progress was made in building levees along the Mississippi River. In that year Congress granted land for levees. Not much was done until 1884, however, when the Yazoo-Mississippi Levee District was formed. The last general flood in the county was in 1897. After the flood of 1927 in the lower Mississippi Delta, the Federal Government in 1928 passed the Flood Control Act and took control of the levee system.

Time

All of the soils in the county have developed from alluvial sediments carried in by the Mississippi River. The Delta area was covered originally by sea water, and the alluvial sediments of which the Delta is formed are several hundred feet thick. The sediments in the area probably were deposited when glaciers melted in the northern part of the Mississippi drainage system.

The sediments from which the soils have formed have been deposited very recently, in terms of geologic age. Even now, new sediments are being deposited rapidly between the river and its levees.

Morphology and Composition

Soil morphology in Coahoma County is expressed generally in faint horizons. Some of the soils do have one distinct, or prominent, horizon, but they are in the minority. None of the soils have prominent horizons within the solum. Marked differences in texture of the solum or C horizon and an underlying D horizon occur in some profiles, as, for example, in the Tunica soils formed from thin beds of clay over sand. Generally speaking, the soils are in the early stages of horizon differentiation, or the differentiation has scarcely started and the horizons themselves are indistinct.

The differentiation of horizons in soils of the county is the result of one or more of the following processes: Accumulation of organic matter, leaching of carbonates and salts more soluble than calcium carbonate, translocation of silicate clay minerals, and reduction and transfer of iron. In most soil profiles in the county two or more of these processes have operated in the development of horizons. For example, the first two are reflected in the feeble horizons of Crevasse sandy loam, whereas the first and last are chiefly responsible for the morphology of Sharkey clay. All four processes have operated to some extent in the differentiation of horizons in the Dundee soils.

Some organic matter has accumulated in the uppermost layer of all but a few soils in Coahoma County to form an A_1 horizon. Much of that organic matter is in the form of humus. The quantities are very small in some soils but fairly large in others. Soils such as Clack loamy sand have faint and thin A_1 horizons low in organic matter at best. Some areas of the soil lack any A_1 horizon. Other soils, such as Sharkey clay, have evident, thick A_1 horizons fairly high in organic matter. Taking the soils of the county as a whole, the accumulation of organic matter has been most important among processes of horizon differentiation.

Leaching of carbonates and salts has occurred in all the soils of the county, although it has been of limited importance to horizon differentiation. The effects have been indirect in that the leaching permitted the subsequent translocation of silicate clay minerals in some soils. Carbonates and salts have been carried completely out of the profiles of most of the well-drained soils. Even in the wettest soils, some leaching is indicated by the absence of carbonates and by the acid reaction. Leaching of the very wet soils is slow because water movement through the profile is itself slow. Leaching has also made little progress in removal of carbonates from soils forming on the most recent sediments near the channel of the Mississippi River. Carbonates and other salts have been washed out of the profiles of most soils in Coahoma County.

Translocation of silicate clay minerals has contributed to the development of horizons in relatively few soils in the county, mainly in the soils of the Dubbs, Dundee, and Bosket series. Darker coatings on ped faces and clay films in former root channels in the B horizon of these soils indicate some downward movement of silicate clay minerals from the A horizons. The actual amount of clay movement has been small, but it has contributed to horizon differentiation. In the Dubbs, Dundee, and Bosket soils, translocation of clay has been about as important as the accumulation of organic matter in horizon differentiation. Leaching of carbonates and salts from the upper part of the profile seems to be a necessary prelude to the movement of the silicate clays.

The reduction and transfer of iron has occurred in all of the very poorly drained, poorly drained, and somewhat poorly drained soils. It has also occurred to some extent in deeper horizons of moderately well drained soils, such as Dundee very fine sandy loam. In the large areas of naturally wet soils in Coahoma County, the reduction and transfer of iron, a process often called gleying, has been of importance in horizon differentiation.

The gray colors of the deeper horizons of the wet soils indicate the reduction of iron oxides. This reduction is commonly accompanied by some transfer of the iron, which may be local or general in character. After it has been reduced, iron may be removed completely from some horizons and may even go out of the soil profile. More commonly in Coahoma County, it has moved a short distance and stopped either in the horizon of its origin or in a nearby horizon. Iron has been segregated within deeper horizons of many of the soils to form yellowish-red, strong-brown, or yellowish-brown mottles. Iron has also been segregated into concretions in the deeper profiles of some of the soils.

The differentiation of the A_1 horizon from the deeper ones in the poorly drained soils of Coahoma County is caused in part by the reduction and transfer of iron. Horizon differences also result, in part, from a greater accumulation of organic matter in the surface layer. The effects of gleying—the reduction and transfer of iron—are evident, but not prominent, in the profiles of the soils in Coahoma County generally. This seems to reflect the youth of the land surface and of the soils. The time during which the sediments have been subject to horizon differentiation has not yet been long enough to permit the development of prominent horizons in the soil profiles.

The comparative effects of the several processes in horizon differentiation can be illustrated by detailed profile descriptions. Representative soil profiles from adjacent Tunica County are therefore described in subsequent paragraphs. Field descriptions are supplemented by laboratory analyses in some cases. One or more profile descriptions are given for Sharkey clay; Dubbs silt loam, level phase; Dubbs very fine sandy loam, level phase; Robinsonville very fine sandy loam; and Mhoon silt loam. The location of each profile is given either by legal description of the site, or by reference to a geographic landmark. Profiles that were sampled for laboratory analyses are numbered for identification in the tables of data. The classification of these soils into great soil groups and orders is considered in the section that follows the descriptions and laboratory data.

Sharkey clay.—This is one of the most extensive soil types in Coahoma County and represents a group formed entirely or very largely from slack-water sediments. Three profiles of Sharkey clay were described and sampled in different localities, and their descriptions are as follows:

Sharkey clay (Profile No. 1: D45 Mi 014—1 to 8) NE¼NE¼ sec. 2, T. 7 S., R. 12 W.:

A_{1p} 0 to 5 inches (the furrow slice) very dark gray (5Y 3/1 to 10YR 3/1) clay with moderate medium granular structure; hard when dry, friable when moist, plastic when wet; abrupt lower boundary.

A_{12} 5 to 10 inches, very dark gray (5Y 3/1) clay, a trifle lighter in color when crushed; few fine, faint, brownish-yellow (10YR 6/6) mottles; weak medium granular structure; very hard when dry, very firm when moist; gradual lower boundary.

A_{13} 10 to 16 inches, very dark gray (5Y 3/1) clay, a trifle lighter in color when crushed; few, fine, faint, brownish-yellow (10YR 6/6) mottles; weak medium granular structure; very hard when dry, very firm when moist; irregular, gradual lower boundary.

C_{1g} 16 to 28 inches, mottled light brownish-gray (2.5Y 6/2), light olive-gray (5Y 6/2), brownish-yellow (10YR 6/8), and strong-brown (7.5YR 5/8) clay; mottles are light yellowish brown (10YR 6/4); massive; very hard when dry, very firm when moist, very plastic and very sticky when wet; cores of olive-gray clay 5 to 15 mm. in diameter extend down from A_{13}; gradual lower boundary.

C_{2g} 28 to 34 inches, mottled grayish-brown (2.5Y 5/2), light olive-brown (2.5Y 5/4), and yellow (10YR 7/6) clay; mottles are fine, faint, many; massive; very hard when dry, firm when moist, very plastic and very sticky when wet; few very fine pores; gradual boundary.

D_g 34 to 55 inches+, mottled dark olive-gray (5Y 3/2), olive (5Y 4/3), dark grayish-brown (2.5Y 4/2), and brown (7.5YR 5/4) clay; mottles are fine, faint, many; massive to very weak fine and medium granular structure; very hard to extremely hard when dry, very firm when moist, very plastic and very sticky when wet.

Sharkey clay (Profile No. 2: D45 Mi 017—1 to 6) SE¼SE¼ sec. 33, T. 4 S., R. 11 W.:

A_{1p} 0 to 4 inches, very dark gray (10YR 3/1) clay with moderate fine granular structure; hard when dry, friable when moist, very plastic and sticky when wet; abrupt lower boundary.

A_{1g} 4 to 13 inches, very dark gray (5Y 3/1) clay mottled with dark brown (7.5YR 4/4); mottles are fine, distinct, many; massive with slight indication of very fine irregular blocky structure in lower part; extremely hard when dry, extremely firm when moist, very plastic and very sticky when wet; black flecks in upper part and few spherical pockets (20 to 30 mm. in diameter) of darker soil material in lower part; gradual lower boundary.

AC_g 13 to 17 inches, mottled very dark gray (5Y 3/1), olive (5Y 5/4), and strong-brown (7.5YR 5/6) clay; mottles are fine, distinct, many; massive with slight suggestion of weak medium irregular blocky structure; extremely hard when dry, extremely firm when moist, very plastic and very sticky when wet; largely interpenetrating cores and masses from horizons above and below.

C_{1g} 17 to 24 inches, mottled gray (5Y 6/1), brownish-yellow (10YR 6/8), and reddish-yellow (7.5YR 6/8) clay; mottles are fine, distinct to prominent, many; crushed soil is olive brown (2.5Y 4/4); massive; extremely hard when dry, extremely firm when moist, very plastic and very sticky when wet; few dark cores extend into layer from above; gradual lower boundary.

C_{2g} 24 to 42 inches+, mottled dark-gray (5Y 4/1) and olive-brown (2.5Y 4/4) clay; mottles are fine, faint, many; massive; extremely firm when dry, very plastic and very sticky when wet.

Sharkey clay (Profile No. 3: D45 Mi 018—1 to 4) NW¼NW¼ sec. 2, T. 5 S., R. 11 W.:

A_{1p} 0 to 4 inches, very dark gray (10YR 3/1) clay with moderate fine to medium granular structure; hard when dry, friable when moist, very plastic and sticky when wet; (furrow slice); abrupt lower boundary.

A_{1g} 4 to 13 inches, very dark gray (5Y 3/1) clay mottled with yellowish brown (10YR 5/6) and yellowish red (5YR 4/6); mottles are mostly yellowish brown, fine to medium, distinct to faint, many; massive with suggestion of weak coarse irregular blocky structure; very hard when dry, extremely firm when moist, very plastic and very sticky when wet; gradual lower boundary.

C_{1g} 13 to 23 inches, mottled olive-gray (5Y 5/2), brownish-yellow (10YR 6/8), and strong-brown (7.5YR 5/8) clay; mottles are fine and medium, distinct, many; massive; extremely hard when dry, extremely firm when moist, very plastic and very sticky when wet; few dark cores (10 to 30 mm. in diameter) extend down into this horizon from above; gradual lower boundary.

C_{2g} 23 to 36 inches+, mottled gray (5Y 5/1) and strong-brown (7.5YR 5/8) clay; mottles are fine, prominent to distinct, many; layer appears speckled in place; massive; extremely hard when dry, extremely firm when moist, very plastic and very sticky when wet; few worm channels and dark cores reach into this horizon.

The chief horizon distinctions in the three profiles of Sharkey clay are in color—mainly differences in hue and in degree of mottling. There are a few slight differences in texture, structure, and consistence, but these occur erratically in the profiles. The A_1 horizons in all three profiles reflect past accumulation of organic matter, and the deeper horizons have been affected by gleying, that is, the reduction and transfer of iron. Evidence of gleying lies in the 5Y hue (Munsell system) and in the mottled color patterns. The ordinary ranges in thickness of horizons, as well as those in drainage, are indicated by the three profiles. A further measure of the low degree of horizon differentiation of Sharkey clay can be derived from the laboratory data in table 8.

As shown by the laboratory data, the content of organic matter decreases with depth, but no other consistent trends or appreciable differences are evident in the profiles. All these profiles are high in clay and low in sand, have high cation exchange capacities, and high values for exchangeable calcium, magnesium, and potassium. They are low in exchangeable hydrogen as compared to exchangeable bases; percentage base saturation is high. The high exchange capacities are consistent with the identification of montmorillonite as a dominant clay mineral in Sharkey clay. The analytical data for the three profiles, as a whole, emphasize further the low degree of horizon differentiation.

Lack of distinct horizons in Sharkey clay is a reflection of the youth of the soils, the resistance of fine sediments to change, and some mixing of materials within the profile. The youth of the land surface and of the sediments in Coahoma County has been discussed earlier. The fine texture of soils such as Sharkey clay acts as an effective brake on processes of horizon differentiation. Movements of constituents from one horizon to another are naturally slow in profiles with many fine pores and few large ones. Rates of hydrolysis and breakdown of primary minerals are reduced because of the slow removal of the end products of those processes.

Mixing of materials from the present horizons is a further factor offsetting horizon differentiation in Sharkey clay. Because of the montmorillonitic nature of the clay, the soil shrinks greatly when it becomes dry. Cracks that are from 1 to 4 inches wide form at the surface. These cracks extend downward for 2 or 3 feet and become narrower with increasing depth. When the soil becomes wet again, it swells so that the cracks close; but seldom does that happen before some material from the A_1 horizon drops down into the cracks and becomes mixed with the C or D horizon. The shrinking and swelling seems to be less than it is in the Grumusols (*8*) or the Regur soils of India (*11*), but the process is operating to some extent, the degree of which is as yet unknown. The mixing or churning of the soil seems to have partly offset horizon differentiation.

Dubbs soils.—The well-drained soils formed on the older natural levees may be represented by the Dubbs series, which has slightly more distinct horizons than Sharkey clay. Closely related to the Dubbs soils in profile characteristics and in processes of formation are the Bosket and Dundee soils. Collectively, these soils occupy slightly more than one-fourth of the total area of Coahoma County, but they are among its most productive soils. Two profiles of Dubbs silt loam, level phase, and one of Dubbs very fine sandy loam, level phase, were described and sampled at different places in Tunica County. The descriptions of the three profiles are as follows:

Dubbs silt loam, level phase (Profile No. 4: D44 Mi 001—1 to 7) NW¼ sec. 6, T. 6 S., R. 11 W.:

A_p 0 to 4 inches (furrow slice), dark grayish-brown to dark yellowish-brown silt loam with moderate medium granular structure; very friable; abrupt lower boundary.

B_{21} 4 to 9 inches, variegated dark yellowish-brown and dark-brown silty clay loam with strong fine subangular blocky structure; friable; crushed mass is yellowish brown; gradual lower boundary.

B_{22} 9 to 20 inches, variegated dark yellowish-brown to yellowish-brown silt loam with moderate medium and coarse subangular blocky structure, lighter in color when crushed; friable when moist, slightly plastic when wet; few very fine and dark-brown concretions and yellowish-red specks inside peds; pinholes common; texture becomes coarser with increasing depth; gradual lower boundary.

Table 8.—*Particle size distribution, organic matter, exchangeable cations, base saturation, and pH, by horizons, for Sharkey clay*

[Analysis by Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md.]

Profile and laboratory number	Horizon	Depth	Mechanical separates: Very coarse sand, coarse sand, and medium sand [2]	Mechanical separates: Fine sand	Mechanical separates: Very fine sand	Mechanical separates: Silt	Mechanical separates: Clay	Organic matter [3]	Exchangeable cations [1]: H	Exchangeable cations [1]: Ca	Exchangeable cations [1]: Mg	Exchangeable cations [1]: K	Sum of cations	Base-saturation	pH
Profile No. 1—(D45 Mi 014—1 to 8):		*Inches*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Percent*	
46244	A_{1p}	0–5	1. 7	1. 3	1. 7	38. 2	57. 1	3. 7	9. 7	25. 0	7. 9	1. 1	43. 7	78	5. 6
46245	A_{12}	5–10	1. 0	1. 3	1. 8	34. 1	61. 8	2. 8	10. 3	23. 8	8. 0	. 8	42. 9	76	5. 2
46246	A_{13}	10–16	1. 2	1. 6	2. 2	37. 5	57. 5	2. 5	13. 9	19. 1	7. 5	. 6	41. 1	66	5. 0
46247	C_{1g}	16–28	. 4	. 5	1. 6	35. 6	61. 9	. 9	11. 7	20. 0	9. 7	. 7	42. 1	72	4. 6
46248	C_{g}	28–34	. 5	. 7	2. 9	37. 1	58. 8	. 9	10. 7	21. 6	10. 5	. 7	43. 5	75	4. 8
46249	D_{g}	34–42	. 7	. 9	4. 3	33. 2	60. 9	. 9	9. 4	21. 8	10. 5	. 7	42. 4	78	4. 9
46250	D_{g}	42–49	. 8	1. 0	4. 1	39. 2	54. 9	. 7	6. 4	21. 7	10. 1	. 6	38. 8	84	5. 3
46251	D_{g}	49–55	. 9	. 7	2. 4	43. 9	52. 1	. 6	3. 7	23. 3	10. 5	. 5	38. 0	90	6. 1
Profile No. 2—(D45 Mi 017—1 to 6):															
46264	A_{1p}	0–4	1. 3	1. 5	2. 5	34. 4	60. 3	2. 5	7. 6	25. 9	9. 2	1. 1	43. 8	83	5. 9
46265	A_{1g}	4–8	1. 1	1. 0	1. 5	31. 8	64. 6	2. 2	7. 1	28. 0	9. 8	. 7	45. 6	84	5. 9
46266	A_{1g}	8–13	1. 3	1. 2	1. 9	33. 0	62. 6	2. 3	6. 4	27. 3	10. 2	. 6	44. 5	86	5. 9
46267	AC_{g}	13–17	2. 7	1. 7	1. 8	35. 0	58. 8	1. 6	7. 7	25. 6	10. 2	. 6	44. 1	83	5. 9
46268	C_{1g}	17–24	. 3	. 7	1. 9	31. 8	65. 3	1. 2	7. 3	24. 7	11. 8	. 6	44. 4	84	5. 6
46269	C_{2g}	24–42	. 4	. 6	1. 6	35. 6	61. 8	1. 2	7. 3	23. 3	11. 9	. 7	43. 2	83	5. 5
Profile No. 3—(D45 Mi 018—1 to 4):															
46270	A_{1p}	0–4	1. 1	. 9	. 7	32. 1	65. 2	2. 4	6. 8	26. 9	9. 4	1. 0	44. 1	85	5. 9
46271	A_{1g}	4–13	1. 3	. 8	. 4	32. 5	65. 0	1. 8	5. 4	27. 1	8. 9	. 7	42. 1	87	6. 2
46272	C_{1g}	13–23	1. 1	1. 0	. 6	37. 4	59. 9	1. 1	7. 8	26. 9	9. 6	. 6	44. 9	83	5. 6
46273	C_{2g}	23–36	. 6	. 7	. 4	39. 4	58. 9	. 5	8. 2	19. 6	11. 3	. 7	39. 8	79	5. 0

[1] Chemical data obtained by Fidelia Davol, Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md.

[2] Very coarse sand, coarse sand, and medium sand are combined here because of the very small amounts of each.

[3] The content of organic matter was estimated by the hydrogen peroxide method (*9*).

B_3 20 to 30 inches, yellowish-brown very fine sandy loam with weak coarse irregular blocky structure; some ped faces have dark yellowish-brown coatings; pinholes common; few very dark brown streaks, which are former root channels; very friable when moist, nonplastic when wet; gradual lower boundary.

C_1 30 to 36 inches, yellowish-brown very fine sandy loam to loamy very fine sand; structureless; soft when dry, very friable when moist, nonplastic when wet; distinct lower boundary.

C_2 36 to 48 inches, light yellowish-brown very fine sandy loam; structureless; soft when dry, very friable when moist, nonplastic when wet; distinct lower boundary.

D 48 to 56 inches+, light yellowish-brown loamy fine sand with fine light-gray and reddish-yellow flecks; structureless; loose when dry, nonplastic when wet.

Dubbs silt loam, nearly level phase (Profile No. 5: D44 Mi 004—1 to 6) SE¼NE¼ sec. 13, T. 6 S., R. 12 W.:

A_p 0 to 5 inches (furrow slice), grayish-brown to dark yellowish-brown silt loam with moderate fine granular structure; very friable; abrupt lower boundary.

B_{21} 5 to 11 inches, dark yellowish-brown clay loam with strong medium subangular blocky structure; crushes readily to mixture of moderate fine subangular blocks and moderate medium granules; hard when dry, friable when moist, slightly plastic when wet; few pinholes; crushed mass is yellowish brown; gradual lower boundary.

B_{22} 11 to 14 inches, yellowish-brown heavy loam with weak to moderate coarse irregular blocky structure; peds have partial coatings of dark yellowish brown, and the interiors have a network of pinholes with very dark brown linings; hard when dry, friable when moist, slightly plastic when wet.

B_3 14 to 21 inches, light yellowish-brown very fine sandy loam mottled with reddish yellow; mottles are fine, faint, many; weak coarse irregular blocky structure; pinholes and very dark brown streaks are common; gradual lower boundary.

C_{1g} 21 to 33 inches, mottled pale-yellow and reddish-yellow very fine sandy loam; mottles are fine, faint, many; crushed mass appears light yellowish brown; structureless; soft when dry, very friable when moist; pinholes few to common; black and very dark brown, very fine, soft concretions are common (2 per square inch); gradual lower boundary.

C_{2g} 33 to 60 inches +, mottled pale-yellow, reddish-yellow, and light-gray very fine sandy loam; mottles are fine, faint to distinct, many; structureless; soft when dry, very friable when moist; few, black and very dark brown, very fine concretions.

Dubbs very fine sandy loam, level phase (Profile No. 6: D44 Mi 003—1 to 6) NE¼NW¼ sec. 17, T. 6 S., R. 11 W.:

A_p 0 to 5 inches, variegated dark yellowish-brown and dark grayish-brown very fine sandy loam with weak fine granular structure; very friable; abrupt lower boundary; this is the furrow slice.

B_{21} 5 to 12 inches, variegated very dark brown and dark grayish-brown clay loam with strong fine and medium subangular blocky structure; lighter in color when crushed; hard when dry, firm when moist, slightly plastic when wet; pinholes are common; gradual lower boundary.

B_{22} 12 to 19 inches, variegated yellowish-brown, dark yellowish-brown, and very dark brown silty clay loam with strong coarse subangular blocky structure; peds have very dark brown coatings and yellowish-brown to dark yellowish-brown interiors marked by network of pinholes with very dark brown linings; very hard when dry, firm when moist, slightly plastic when wet; gradual lower boundary.

B_3 19 to 26 inches, yellowish-brown very fine sandy loam with weak coarse irregular blocky structure; peds have partial dark-brown coatings, which fade in lower part; slightly hard when dry, very friable when moist, nonplastic when wet; gradual lower boundary.

C 26 to 36 inches, yellowish-brown loamy very fine sand with few dark-brown streaks; structureless; slightly hard when dry, very friable when moist, nonplastic when wet; gradual lower boundary.

D 36 to 60 inches +, light yellowish-brown very fine sand; structureless; loose.

Horizons in the Dubbs profile are set apart by differences in one or more of the following: Color, texture, structure, and consistence. For example, the A horizon is darker than the B or C horizons but not much darker than the upper B horizon. The B horizons have finer texture, less friable consistence, and more distinct structure than the others. Clay films are also present on some ped faces and in pores of the B_2 horizons but are absent from the others. Even with differences in more than one property, however, the horizons are not yet distinct, except for the D horizons in profiles No. 4 and No. 6. The markedly different D horizons in those profiles reflect stratification of the alluvium rather than horizon development.

Some indication of normal ranges in thickness, texture, structure, and consistence of horizons is provided by the three profile descriptions. The thickness of the solum, the combined A and B horizons, ranges from about 20 to 30 inches. The texture ranges from very fine sandy loam to silt loam in the A horizon and from clay loam to silty clay loam in the B horizon. The first and last of the three profiles are well drained, whereas slight restriction of drainage in the C horizon is evident in profile No. 5. In its natural drainage, this profile is marginal to the Dundee soils, although it lies within the permissible range of the Dubbs series.

Analytical data for the three Dubbs profiles are given in table 9. These data, providing further characterization of the soils, are consistent with the morphological features described in the field.

Few horizon differences are indicated by the laboratory data. The A horizon is higher in organic matter than the B and C horizons, although the distinction between it and the upper B horizon is very small. It seems certain that the original content of organic matter in the A horizon, especially in the upper part, has been lowered by cultivation of the soils. The B_2 horizons are sharply higher in clay than are the A and C horizons. This difference may be caused in part by stratification.

The relative proportions of fine sand, very fine sand, and silt change from one horizon to another in the profiles. The shifts in relative amounts of the three size fractions suggest stratification of the sediments that now comprise the soil profile. Present distribution of clay in the profiles may therefore be more the result of original differences than of horizon differentiation. Despite that probability, the presence of clay films on ped faces and in pores of the B_2 horizons demonstrate some movement of silicate clay minerals downward from the A horizon. Base status is high throughout the profiles, and calcium is dominant among the exchangeable cations. This is further evidence of limited weathering and is consistent with the low degree of horizon differentiation.

Lack of distinct horizons in the Dubbs soils seems largely caused by their youth. Carbonates and salts have been completely removed from the solum, and leaching has also replaced some of the exchangeable bases with hydrogen. Organic matter has accumulated in the upper horizons, doubtless originally in larger amounts than are now present. Some translocation of silicate clay minerals

TABLE 9.—*Particle size distribution, organic matter, exchangeable cations, base saturation, and pH, by horizons, for Dubbs silt loam and Dubbs very fine sandy loam*

[Analysis by Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md.]

Profile and laboratory number	Horizon	Depth	Mechanical separates: Very coarse sand and coarse sand [2]	Medium sand	Fine sand	Very fine sand	Silt	Clay	Organic matter [3]	Exchangeable cations [1]: H	Ca	Mg	K	Sum of cations	Base saturation	pH
Dubbs silt loam, level phase—																
(Profile No. 4: D44 Mi 001—1 to 7):		*Inches*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Me./100 gm.*	*Percent*	
D4354	A_p	0–4	0. 2	0. 2	1. 2	13. 6	65. 5	19. 3	1. 5	3. 3	12. 0	2. 1	1. 05	18. 4	82	6. 6
D4355	B_{21}	4–9	. 1	. 1	. 6	13. 3	54. 8	31. 1	1. 2	5. 9	15. 9	3. 1	. 92	25. 8	77	6. 2
D4356	B_{22}	9–20	. 1	. 1	. 5	20. 3	54. 1	24. 9	. 8	6. 6	11. 9	2. 7	. 53	21. 7	70	5. 4
D4357	B_3	20–30	. 1	. 1	1. 1	42. 2	39. 2	17. 3	. 5	5. 1	8. 6	2. 1	. 46	16. 3	68	5. 3
D4358	C_1	30–36	. 1	. 1	2. 3	54. 1	32. 9	10. 5	. 3	3. 5	6. 6	1. 6	. 31	12. 0	71	5. 5
D4359	C_2	36–48	. 2	. 1	1. 4	43. 8	42. 2	12. 3	. 3	4. 1	7. 5	1. 9	. 43	13. 9	71	5. 3
D4360	D	48–57	. 1	. 1	2. 9	60. 3	29. 1	7. 5	. 1	2. 9	5. 7	1. 5	. 47	10. 6	72	5. 3
(Profile No. 5: D44 Mi 004—1 to 6):																
D4373	A_p	0–5	. 4	. 6	3. 2	25. 2	55. 5	15. 1	1. 0	4. 2	8. 0	1. 8	. 78	14. 8	72	6. 2
D4374	B_{21}	5–11	. 1	. 1	. 7	28. 6	42. 6	28. 5	. 7	10. 7	8. 2	3. 2	. 53	22. 6	53	4. 6
D4375	B_{22}	11–14	. 1	. 1	1. 0	36. 0	38. 4	24. 4	. 6	9. 4	7. 7	3. 0	. 40	20. 5	54	4. 7
D4376	B_3	14–21	. 1	. 1	1. 6	49. 5	31. 9	16. 8	. 2	9. 1	6. 1	2. 9	. 35	18. 4	50	4. 8
D4377	C_{1g}	21–33	. 2	. 2	1. 1	42. 4	39. 6	16. 5	. 2	4. 9	7. 3	2. 9	. 43	15. 5	68	5. 0
D4378	C_{2g}	33–60	. 2	. 2	. 9	45. 4	40. 4	12. 9	. 0	3. 2	7. 8	2. 6	. 35	14. 0	77	5. 4
Dubbs very fine sandy loam, level phase—																
(Profile No. 6: D44 Mi 001—1 to 6):																
D4367	A_p	0–5	. 3	. 2	3. 5	33. 5	46. 2	16. 3	1. 7	5. 2	7. 2	1. 6	. 60	14. 6	64	5. 4
D4368	B_{21}	5–12	. 1	. 1	1. 2	25. 2	38. 2	35. 2	1. 6	11. 6	9. 2	2. 3	. 43	23. 5	51	4. 6
D4369	B_{22}	12–19	. 0	. 0	1. 6	46. 7	25. 3	26. 4	1. 3	10. 7	8. 4	2. 5	. 33	21. 9	51	4. 8
D4370	B_3	19–26	. 1	. 1	2. 7	65. 3	15. 0	16. 8	. 7	6. 7	6. 1	2. 0	. 28	15. 1	56	4. 9
D4371	C	26–36	. 0	. 0	13. 7	70. 2	8. 7	7. 4	. 2	2. 9	3. 9	1. 2	. 21	8. 2	65	5. 2
D4372	D	36–60	. 0	. 0	42. 2	49. 9	5. 2	2. 7	. 0	1. 6	3. 1	. 8	. 21	5. 7	72	5. 8

[1] Chemical data obtained by Fidelia Davol, Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md.

[2] Very coarse sand and coarse sand are combined here because of the very small amounts of each.

[3] The content of organic matter was estimated by the hydrogen peroxide method (*9*).

has taken place, but this process is in very early stages. As time passes, the differentiation of horizons may be expected to continue.

Robinsonville very fine sandy loam.—Accumulation of organic matter in the upper profile has been solely responsible for the very slight horizonation in some soils of Coahoma County. These soils are in the first stages of formation from recent sediments. Total extent of these soils, which may be represented by Robinsonville very fine sandy loam, is about the same as that of the Dubbs, Bosket, and Dundee series. A profile description of Robinsonville very fine sandy loam is as follows:

Profile No. 7—Robinsonville very fine sandy loam, near Mhoon Landing:

A 0 to 8 inches, grayish-brown (10YR 5/2) very fine sandy loam with weak fine granular structure; soft when dry, very friable when moist; neutral; gradual lower boundary.

AC 8 to 32 inches, yellowish-brown (10YR 5/4) fine sandy loam with weak fine granular structure to structureless; soft when dry, very friable when moist; neutral to mildly alkaline; gradual lower boundary.

C 32 to 40 inches+, light yellowish-brown (10YR 6/4) to yellowish-brown (10YR 5/4) loamy fine sand; structureless; loose to very friable; mildly alkaline.

A question may be raised about the recognition of horizons in the Robinsonville profiles, especially when the full range of the series is considered. In the profile described, the surface layer is darker in color and seems higher in organic matter than the deeper layers. Hence, it is identified as an A horizon. This horizon seems to be in the earliest stages of differentiation and may be considered incipient.

Within the range of the Robinsonville series are other profiles that lack darkened surface layers and are essentially uniform in color throughout. These profiles may be considered as having no more than a C horizon. They comprise materials from which soils are being formed. Some carbonates and salts have been leached from these latter profiles, but some also remain. Robinsonville very fine sandy loam represents a group of well-drained soils in which horizon differentiation is just beginning.

Mhoon silt loam.—Some of the soils in the first stages of horizon development are wet at least part of the time. Their morphology reflects this wetness, although the degree of horizon differentiation parallels that of Robinsonville very fine sandy loam. These wet soils can be represented by Mhoon silt loam, a profile description of which follows. The profile of Mhoon silt loam is considered typical of the Mhoon soils in the county, although Mhoon silty clay is the only soil type mapped.

Profile No. 8.—Mhoon silt loam, near Mhoon Landing:

A_p 0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam with weak fine granular structure; slightly hard when dry, very friable when moist; neutral to mildly alkaline; clear lower boundary.

AC 6 to 15 inches, dark grayish-brown (10YR 4/2) silt loam with few, fine, faint mottles of grayish-brown and yellowish-brown; weak fine granular structure to structureless; slightly hard when dry, friable when moist; neutral to mildly alkaline.

A_b 15 to 26 inches, dark grayish-brown (10YR 4/2) silt loam with few, fine, faint mottles of yellowish brown and gray; weak fine granular structure; slightly hard when dry, very friable when moist; neutral to mildly alkaline.

C_{bg} 26 to 40 inches+, mottled gray (5YR 6/1), yellowish-brown (10YR 5/4), and yellow (10YR 7/6) silty clay loam; mottles in the gray matrix are fine and medium, distinct, and many; massive; hard when dry, firm when wet; neutral to mildly alkaline.

This one profile of Mhoon silt loam appears to consist of a recent thin deposit and part of a former soil. The present cycle of horizon differentiation seems to be operating partly in the thin mantle and partly in the buried soil. The surface horizon (A_b) of the buried soil is now functioning as the C horizon for the modern soil that is in process of formation.

In the profile of Mhoon silt loam, as in that of Robinsonville very fine sandy loam, horizon differentiation is in the very early stages. Organic matter has accumulated in the surface layer to form an incipient A horizon. In this respect the two soils are alike. Because of the wetness of the Mhoon soils, some reduction has also occurred in the profile, as evidenced by the mottling. It is possible that the mottling in the A_b and C_{bg} horizons may have developed before the 15-inch surface layer was deposited, but processes responsible for mottling still seem to be operating.

Because the soil is in the early stages of formation, the question may be raised about need for recognition of horizons in the profile of Mhoon silt loam. The A_p horizon is incipient in character, and the leaching of carbonates and salts has not progressed far. Mottled patterns of colors can be developed in soils within a few years. It is clear that horizon differentiation in Mhoon silt loam, as in Robinsonville very fine sandy loam, has made little progress and is yet in the earliest stages. The horizons barely qualify for recognition and are very faint at best.

Classification of Soils by Higher Categories

Soils are placed in narrow classes for the organization and application of knowledge about their behavior within farms and counties. They are placed in broad classes for study and comparisons of large areas such as continents. In the comprehensive system of soil classification followed in the United States (*2*), the soils are placed in six categories, one above the other. Beginning at the top, the six categories are the order, suborder, great soil group, family, series, and type.

In the highest category, soils of the whole country are grouped into three orders, whereas thousands of soil types are recognized in the lowest category. The suborder and family categories have never been fully developed and thus have been little used. Attention has largely been given to the classification of soils by soil types and series within counties or comparable areas and to the subsequent grouping of series by great soil groups and orders. Soil series and soil type are defined in the glossary. A subdivision of the soil type, the soil phase, is also defined in the glossary.

Classes in the highest category of the classification scheme are the zonal, intrazonal, and azonal orders (*2*). The zonal order comprises soils with evident, genetically related horizons that reflect the predominant influence of climate and living organisms in their formation. The intrazonal order includes soils with evident, genetically related horizons that reflect the dominant influence of a local factor of topography, parent materials, or time over the effects of climate and living organisms. The azonal order includes soils that lack distinct, genetically related horizons, commonly because of youth, resistant parent material, or steep topography.

Among the soils of Coahoma County, the soils of the

Dubbs, Bosket, and Dundee series may be considered zonal soils. The horizons in those soils are evident but more nearly faint than distinct. They are genetically related and seem to reflect the influence of climate and living organisms, although the effect of time is also important. The three series are considered to fall barely within the zonal order and may be looked upon as intergrades to the azonal order.

The Dubbs, Dundee, and Bosket series are tentatively classified in the Gray-Brown Podzolic group, although there is evidence for placing them in the Prairie group as well. Gray-Brown Podzolic soils have thin, dark A_1 horizons over light brownish-gray and often platy A_2 horizons, which are underlain by brown to yellowish-brown, finer textured B horizons that grade to lighter colored and generally coarser textured C horizons.

Prairie soils have thick, dark grayish-brown to very dark brown A_1 horizons grading to brownish B horizons, which may be mottled. The B horizons grade, in turn, to lighter colored and generally coarser textured C horizons. Both great soil groups normally occur under humid, cool-temperate climates, the former under deciduous forest (*6*), and the latter under tall prairie grasses.

The Dubbs, Dundee, and Bosket soils lack a distinct A_2 horizon, but all areas of the soils have been disturbed through cultivation. Consequently, it seems highly probable that the plow layer now includes former thin A_1 and A_2 horizons. The soils clearly lack thick, dark A_1 horizons and do not appear to have had them in the past.

The present character of the B horizon, using the Dubbs profile as an example, would permit classification of the soils in either of the two great soil groups. The apparent absence of a thick A_1 horizon, and the probability that the A_1 and A_2 horizons have been mixed by plowing, is used as a basis for placing the soils in the Gray-Brown Podzolic group. It should be recognized, however, that the series are intergrades to the Prairie soils, being almost as much like them as they are like the central members of the Gray-Brown Podzolic group.

Soils of the intrazonal order are by far the most extensive in Coahoma County. These include the Alligator, Dowling, Forestdale, and Sharkey series, as well as others that were not classified into series during the field survey. All of these are either poorly drained or somewhat poorly drained. None seem to have distinct horizons, although they show the effects of gleying and accumulation of organic matter in their morphology. These soils either are members of or are closely related to hydromorphic groups. The absence of a thick A_1 horizon high in organic matter is used as a basis for excluding these series from the Humic Gley (Wiesenboden) group (*12*). Therefore, they seem more appropriately classified as Low-Humic Gley soils (*12*), with the exception of Sharkey clay. This clay exhibits properties of churning through shrinking, swelling, and cracking and is therefore tentatively classified as a Grumusol (*8*).

Recognition of the Low-Humic Gley group was proposed initially for somewhat poorly drained to poorly drained soils lacking prominent A_1 horizons but having strongly gleyed B and C horizons with little textural differentiation. The recognition of two great soil groups, Low-Humic Gley and Humic Gley soils, was based on thickness of the A horizon and on its content of organic matter.

Humic Gley soils are defined as high in organic matter, whereas Low-Humic Gley soils are moderate to low. The Alligator, Dowling, and Forestdale soils are not high in organic matter, and they do show effects of gleying in their morphology. Beyond that, there is less evidence of cracking and churning in these soils than in Sharkey clay. On the basis of present knowledge, classification of the three series as Low-Humic Gley soils seems appropriate. Further studies may indicate that the Alligator and Dowling series are intergrades to Grumusols, because both are closely related to the Sharkey series.

Recognition of Grumusols was proposed (*8*) for a group of soils dominated by montmorillonitic clays. These soils are typically clay in texture, lack eluvial and illuvial horizons, have moderate to strong granular structure in the upper horizons, and have high coefficients of expansion and contraction upon wetting and drying. Calcium and magnesium are dominant in the exchange complex of these soils. With their high coefficients of expansion and contraction, the Grumusols shrink and swell markedly with changes in moisture content. In the process of shrinking and swelling, the soils crack and materials from upper horizons drop down into lower ones. Thus, the soils are being churned, or mixed, continually, a process that partially offsets horizon differentiation.

Grumusols may have prominent A_1 horizons but lack B horizons. They have dull colors of low chroma, as a rule, and are not well drained. Sharkey clay has many of the features common to Grumusols. The profile has a clay texture throughout, and the clay is dominantly montmorillonitic. The soil has a dark A_1 horizon and evidence of gleying in the deeper horizons, which suggest placing the series in the Humic Gley group. Laboratory analyses, however, indicate that the content of organic matter in the A_1 horizon of Sharkey clay is appreciably lower than that normal to Humic Gley soils and more nearly comparable to that of typical Grumusols. Furthermore, the dark A_1 horizon is also common to many Grumusols. Consequently, Sharkey clay is tentatively classified as a Grumusol, but as one which is an intergrade to the Low-Humic Gley group. Sharkey clay seems more poorly drained than is typical of Grumusols, but it is not too wet for operation of the churning and mixing process.

Azonal soils are less extensive in Coahoma County than intrazonal soils, despite the fact that the whole area consists of geologically recent alluvium. Azonal soils are slightly more extensive in the county than zonal soils. At the same time, all soils classified in the zonal and intrazonal orders are marginal to the azonal order because of their low degree of horizonation. Only the series that lack genetically related horizons or are in the initial stages of horizon differentiation are placed in the azonal order. Although the total area of these series is much less than that of intrazonal soils, their number of series is greater. The azonal order includes the Clack, Commerce, Crevasse, Mhoon, Robinsonville, Souva, and Tunica series. These series all belong to the Alluvial great soil group, although some are poorly drained and exhibit effects of gleying.

The Mhoon and Souva soils are poorly drained. Their morphology shows that some reduction and transfer of iron has occurred. Even so, the horizons are faint at best and in some profiles are all but lacking. Consequently, the two series are considered wet Alluvial soils rather than Low-Humic Gley soils. Unless drainage is greatly improved in the future, the two series can be expected to develop into Low-Humic Gley soils as horizon differentiation continues.

The Alluvial soils in Coahoma County lack distinct horizons because the sediments in which they are developing are so young. Given more time under natural conditions, most of these soils would eventually have had profiles similar to those of the Dubbs, Dundee, and Bosket series. It remains to be seen whether such a profile will develop for the soils now cultivated. The regime in which the soils now exist differs greatly from that of their original, natural environment. Some of the processes important in horizon differentiation probably will be accentuated and others subdued. Some may progress more rapidly, and others more slowly. As yet, the net effect of the change in environment on future development of the soils cannot be forecast with any certainty and may not be apparent for some centuries.

Additional Facts About the County

This section is written primarily for those not familiar with the county. It describes the early history and development of the county, public facilities, water supply, and industries and transportation. It also gives facts about agriculture in the county.

Early History and Development

In 1830 the Choctaw Indians ceded territory to the United States. In 1836 part of that territory was organized as a county and was named Coahoma, which means red panther in the Choctaw language. Early settlers came largely from the States along the Atlantic seaboard.

The first county seat was at Port Royal, which was 5 miles south of Friars Point. When Port Royal was cut off from the river, the county seat was moved to Friars Point. Later, it was moved to Clarksdale, its present site. The town of Port Royal no longer exists (*10*).

In early times transportation was by water only, so the first settlers built their homes on the high land along the banks of the Mississippi River (*7*). Most of these old plantations were later abandoned, as were some towns, because of changes in the course of the river and the construction of levees.

In 1950, the population of the county was 49,361; Clarksdale, the largest town, had a population of 16,539. Several other small towns and trading centers are located in the county. The population is shifting to the cities because mechanized methods of farming have reduced the number of workers needed to operate the farms.

Public Facilities

Most of the elementary schools and high schools are in the larger communities. Buses transport the children. There are churches for various denominations throughout the county. A fairly large public library is located in Clarksdale, and a mobile unit carries books to outlying areas of the county (*4*). Also in Clarksdale are six parks and playgrounds. During the summer the playgrounds are maintained by the public school system. A daily and a weekly newspaper are published in the county.

Water Supply

Power pumps and artesian wells supply most of the water for homes in the communities. Water for livestock is pumped from streams, lakes, bayous, ponds, and wells. There are about 80 artesian wells in the county, varying in depth from 439 to 2,000 feet (*3*). The artesian wells are bored through the alluvial sediments of the flood plain down into the coastal plain formations below. Most of the small towns and larger farms have artesian wells. The city of Clarksdale has 6 artesian wells that range from 760 to 1,300 feet in depth (*3*).

In most places in the county, the layer of alluvium ranges from 130 to 180 feet in thickness (*5*). In a few places it is more than 200 feet thick. This layer consists of clay, silt, sand, and gravel. It holds a large amount of water, which meets most of the home needs and provides water for industry and for irrigation. The pumps range from small, hand-driven types to power pumps that deliver as much as 3,000 gallons of water per minute. The water is hard because it contains iron, calcium carbonates, and other minerals. For many uses it needs special treatment.

Industries and Transportation

This county is basically agricultural. In 1954 about 55 percent of the inhabitants were engaged in agriculture. Most of the local industries cater to farm needs or process farm products. There are 49 cotton gins and 2 oilmills where cottonseed is processed. During the last few years, several new companies have located in the county. These include an insecticide company, a fertilizer plant, a plant for manufacturing agricultural machinery, and a plant for processing seed corn. Other nonagricultural industries include factories in which are manufactured hardware for builders, inner tubes for automobiles and trucks, school chairs and other furniture, and concrete products. A meatpacking plant and a hosiery mill are also located in the county (*4*).

The Illinois Central Railroad passes through the county. The main line and some of its branches connect the county with Memphis, Tenn., Helena, Ark., New Orleans, La., and Greenville, Vicksburg, Greenwood, and Jackson, Miss.

Two Federal Highways, 49 and 61, pass generally north and south. They connect the county with Memphis, Tenn., New Orleans, La., and Jackson and Gulfport, Miss. Two State highways pass through the county. State Highway 1 runs north and south almost parallel to the Mississippi River. State Highway 6 runs east and west and crosses Federal Highway 51 outside the county. All Federal and State highways are concrete or have hard surfaces. The many local roads are surfaced with gravel or shale, or they are dirt or unimproved.

Agriculture

This section supplies facts for readers who are not acquainted with the agriculture of Coahoma County. In it are discussed the history of agriculture in the county, the crops and livestock, farm equipment, and the tenure and size of farms. The figures used were taken from the United States Census of Agriculture.

Agricultural history

During the early development of the county, Friars Point was the only shipping point for the area. Travel by roads was almost impossible. Most farms and plantations were nearly self-sufficient. Cotton was exported and exchanged for manufactured articles.

Before the levees were built, the county was flooded on an average of 3 years out of 5 so that only the land at the higher elevations was used. Thus, farming was hazardous and agriculture developed slowly. In 1850, Congress granted land along the Mississippi River to build levees. Little progress was made, however, until the Yazoo-Mississippi Levee District was formed in 1884. With the help of this organization, drainage canals were cut back into the swamps and bayous to reclaim large acreages of land that formerly were flooded during much of the year. The last time the county was flooded was in 1897.

Protection from floods, as well as improved drainage and the development of railroads and county roads, have helped to develop agriculture to the stage it is in today.

Crops

The principal crops grown in the county are cotton, corn, soybeans, oats, hay, rice, and small grains. The acreage of the principal crops is given in table 10.

TABLE 10.—*Acreage of principal crops*

Crops	1939	1949	1954
	Acres	*Acres*	*Acres*
Cotton (harvested)	105, 559	148, 111	100, 101
Corn (harvested for grain)	53, 401	26, 075	19, 721
Soybeans (harvested for beans)	1, 524	6, 603	35, 903
Oats (threshed or combined)	4, 055	2, 043	14, 520
Rice (threshed or combined)	(1)	(2)	1, 837
Other grain (threshed or combined)	46	[3] 634	7, 878
Hay:			
Alfalfa	8, 981	2, 530	1, 620
Lespedeza	994	2, 687	1, 799

[1] Not reported.
[2] Acres included in other grain threshed or combined.
[3] Includes rice.

Cotton has been the principal cash crop since the county was first settled. In recent years, however, part of the acreage formerly used to grow cotton has been shifted to other crops. Beginning in 1934, the Federal acreage allotments on cotton accounted for some of the changes in the cropping pattern. Also, the development of better varieties, the use of fertilizer, and the use of insect control and improved methods of management have all helped to increase yields.

Acreages of corn have decreased, largely as the result of mechanized farming. Nevertheless, yields per acre have increased as more care has been given to selecting soils on which to grow corn, to choosing varieties, and to good management, including the use of fertilizer.

The crop that is grown the second most extensively is soybeans. The poorly drained, fine-textured soils are well suited to this crop. The soybeans are grown for feed and oil.

Oats and other small grains yield well on many of the soils that are not suited to corn. Formerly, most of the oats were fed to work animals on the farm. Now, because of the improvement in marketing facilities, they are grown as a cash crop as well. In addition to being grown for grain, small grains are used extensively for winter grazing.

Rice, a fairly new crop in the county, grows well on certain soils and under moisture conditions that are not suited to many other crops. Yields are high and the quality is good.

Pasture

The permanent pastures in this county are mostly in areas that have fairly steep slopes, or that are along streams and bayous. Other small areas are near the farm headquarters, where they are located for the convenience of the farm operator. More land has been used for pasture since the cotton acreage has been restricted, and the soils now used are more suitable for pasture. Many of the pastures will be returned to row crops in a few years as part of a crop rotation, and new pastures will be seeded. A total of 14,182 acres of cropland was used only for pasture in 1954, an increase of 6,049 acres since 1949.

Livestock

A total of 1,802 horses and mules was reported in the county in 1954, or 2,821 fewer than in 1950. Many animals have been replaced by tractors. The remaining mules are used principally for limited work on the farms, such as for plowing gardens and small acreages, running water furrows, and hauling wood.

The number of cattle has more than doubled during the same period. It increased from 7,361 in 1950 to 15,288 in 1954. Some of the cattle are dairy animals of poor grade owned by tenants and sharecroppers. Many, however, are animals of good grade raised for beef or to provide dairy products on a commercial basis.

Hogs have decreased in number. In 1954 there were 11,466 hogs in the county, 8,421 fewer than in 1950. Many of these are raised for home slaughter. Some are sold for use in brood herds or for market.

Sheep raising is fairly new in this area. In 1954, 2,937 sheep and lambs were reported in the county.

Farm equipment

In 1954, there were 2,314 automobiles on 1,645 farms in the county; 1,181 motortrucks on 776 farms; and 2,738 tractors on 732 farms. This means that about 32 percent of the farms had automobiles and that smaller percentages had trucks and tractors. The land is favorable for tractor farming, and on most of the large farms tractors are used exclusively. In addition to the automobiles, motortrucks, and tractors, there were 293 grain combines in the county, 108 mechanical cornpickers, 177 pick-up hay balers, and a number of mechanical cottonpickers.

Also in 1954, electricity was reported on 3,967 of the farms, piped running water was reported on 654 farms, and telephones were reported on 362 farms.

Size and tenure of farms

Since 1950, there has been a marked decline in the number of farms and a definite increase in the average size of farms. In 1954, there were 5,134 farms in the county, as compared to 6,411 in 1950. The following list, prepared from the 1954 census, shows the number of farms in various size groups in 1950 and 1954:

Size in acres:	In 1950	In 1954
Less than 10	1,399	1,598
10 to 49	4,389	2,999
50 to 179	365	278
180 to 499	124	112
500 to 999	80	87
1,000 or more	54	60

In 1954, tenants operated 90.1 percent of the farms, owners or part owners operated 9.1 percent, and managers operated 0.8 percent. The larger acreages are farmed generally by sharecroppers and workers by the day under the supervision of a farm manager. In this sharecropping system the owner supplies the land, equipment, and capital for the crops, and he advances the tenant credit during the growing season. In return, the tenant provides the labor, and they both receive shares of the returns from the crop. Some tenants also supply the equipment and capital for growing the crop, and they receive larger shares of the profits.

Glossary

[Most of the definitions used were taken from Soil (*14*), or from the Soil Survey Manual (*13*)]

Aggregate (of soil). Many fine soil particles held in a single mass or cluster, such as a clod, crumb, block, or prism. Many properties of the aggregate differ from those of an equal mass of unaggregated soil.

Alluvium. Sand, silt, clay, or other sediments deposited on land by streams.

Available water-holding capacity. *See* Water-holding capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 mm. in diameter. As a soil textural class, soil material that contains 40 percent or more of clay, less than 45 percent of sand, and less than 40 percent of silt.

Complex, soil. An intimate mixture of small areas of different kinds of soils that are too small to be shown separately on a publishable soil map. The whole group of soils must be shown together as a mapping unit and described as a pattern of soils.

Consistence, soil. The attributes of soil material that are expressed by the degree and kind of cohesion and adhesion or by the resistance to deformation or rupture. Terms commonly used to describe consistence are *brittle, compact, firm, friable, plastic, sticky, stiff,* and *tight.*

Contour tillage. Furrows plowed at right angles to the direction of slope, at the same level throughout, and ordinarily at comparatively close intervals.

Cropland. Land regularly used for crops, except forest crops. It includes rotation pasture, cultivated summer fallow, or other land ordinarily used for crops but temporarily idle.

Crumb. Generally soft, small, porous aggregates, irregular but tending toward a spherical shape, such as in the A_1 horizons of many soils. Crumb structure is closely related to granular structure. (*See also* Structure, soil).

Depressional soils. Soils that occupy low or depressed areas. In old stream runs or similar positions, these soils are often landlocked.

Erosion, soil. The wearing away or removal of soil materials by water or wind.

Forest land. Land that bears a stand of trees at any age or stature, including seedlings, and of species that attain a minimum of 6 feet average height at maturity; or land from which such a stand has been removed but on which no other use has been substituted. The term is commonly limited to land not in farms; forests on farms are commonly called woodland or farm forests.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

First bottom. The recent natural levees or normal flood plain of a stream, subject to frequent or occasional flooding.

Genesis, soil. The mode of origin of the soil, with special reference to the processes responsible for the development of the solum (horizons A and B) from the unconsolidated parent material. (*See also* Horizon, soil).

Granular. Roughly spherical, firm, small aggregates that may be either hard or soft but are generally more firm than crumb and without the distinct faces of blocky structure. (*See also* Structure, soil).

Great soil group. Any one of several broad groups of soils that have fundamental characteristics in common.

Horizon, soil. A layer of soil, approximately parallel to the soil surface, with distinct characteristics produced by soil-forming processes.

Horizon A. The master horizon consisting of (1) one or more mineral horizons of maximum organic accumulation; or (2) surface or subsurface horizons that are lighter in color than the underlying horizon and that have lost clay minerals, iron, and aluminum with resultant concentration of the more resistant minerals; or (3) horizons belonging to both of these categories.

Horizon B. The master horizon of altered material characterized by (1) an accumulation of clay, iron, or aluminum, with accessory organic material; or (2) more or less blocky or prismatic structure together with other characteristics, such as stronger colors, unlike those of the A horizons or the underlying horizons of nearly unchanged material; or (3) characteristics of both these categories. Commonly, the lower limit of the B horizon corresponds to the lower limit of the solum.

Horizon C. A layer of unconsolidated material, relatively little affected by the influence of organisms and presumed to be similar in chemical, physical, and mineralogical composition to the material from which at least a portion of the overlying solum has developed.

Horizon D. Any stratum underlying the C, or the B if no C is present, which is unlike the C, or unlike the material from which the solum has formed.

Internal drainage. That quality of the soil that permits the downward flow of excess water through it.

Leaching, soil. The removal of materials in solution by the passage of water through the soil.

Low bottoms. Broad slack-water areas where the clay sediments of the backwaters have dropped out of suspension.

Massive. Large uniform masses of cohesive soil, sometimes with ill-defined and irregular cleavage, as in some of the fine-textured alluvial soils; structureless. (*See also* Structure, soil)

Morphology, soil. The physical constitution of the soil expressed in the kinds of horizons, their thickness and arrangement in the profile, and the texture, structure, consistence, porosity, and color of each horizon.

Mottling, soil. Contrasting color patches that vary in number and size. Descriptive terms are as follows: Contrast—*faint, distinct,* and *prominent;* abundance—*few, common,* and *many;* and size—*fine, medium,* and *coarse.* The size measurements are the following: *Fine,* commonly less than 5 mm. (about 0.2 in.) in diameter along the greatest dimension; *medium,* commonly ranging between 5 and 15 mm. (about 0.2 to 0.6 in.) in diameter along the greatest dimension; and *coarse,* commonly more than 15 mm. (about 0.6 in.) in diameter along the greatest dimension.

Natural drainage. Refers to those conditions that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may result from other causes, as natural deepening of channels or filling of depressions blocking drainage outlets. The following terms are used to express natural drainage: *Excessively drained, somewhat excessively drained, well drained, moderately well drained, imperfectly* or *somewhat poorly drained, poorly drained,* and *very poorly drained.*

Natural levee. The higher land adjacent to streams where the coarse- and medium-textured sediments have settled out of suspension.

Normal soil. A soil having a profile in equilibrium or nearly in equilibrium with its environment, developed under good but not excessive drainage from parent material of mixed mineralogical, physical, and chemical composition, and expressing the full effects of the forces of climate and living matter.

Nutrients, plant. The elements taken in by the plant, essential to its growth, and used by it in the elaboration of its food and tissue. These include nitrogen, phosphorus, calcium, potassium, magnesium, sulfur, iron, manganese, copper, boron, zinc, and perhaps others obtained from the soil; and carbon, hydrogen, and oxygen obtained largely from the air and water.

Parent material. The unconsolidated mass from which the soil profile develops. (*See also* Horizon C; Profile, soil; Substratum).

Permeability, soil. That quality of the soil that enables it to transmit water or air.

Phase, soil. A subdivision of the soil type covering variations that are chiefly in such external characteristics as relief, stoniness, or accelerated erosion.

Plowsole. A compacted layer, several inches thick, immediately beneath the A_p horizon. A plowsole is believed to be caused by tillage implements running over the land.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material. (*See also* Horizon, soil; Parent material.)

Reaction, soil. The degree of acidity or alkalinity of a soil mass, expressed in either pH value or in words, as follows:

	pH
Extremely acid	below 4.5
Very strongly acid	4.5–5.0
Strongly acid	5.1–5.5
Medium acid	5.6–6.0
Slightly acid	6.1–6.5
Neutral	6.6–7.3
Mildly alkaline	7.4–7.8
Moderately alkaline	7.9–8.4
Strongly alkaline	8.5–9.0
Very strongly alkaline	9.1 and higher

Sand. Individual rock or mineral fragments having diameters ranging from 0.5 mm. to 2.0 mm. Usually sand grains consist chiefly of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more of sand and not more than 10 percent of clay.

Series, soil. A group of soils having the same profile characteristics and the same general range in color, structure, consistence, and sequence of horizons; the same general conditions of relief and drainage; and usually a common or similar origin and mode of formation. A group of soil types that are similar in all respects, except for the texture of the surface soil.

Silt. (1) Individual mineral particles of soil that range in diameter between the upper size of clay, 0.002 mm., and the lower size of very fine sand, 0.05 mm. (2) Soil of this textural class contains 80 percent or more of silt and less than 12 percent of clay. (3) Sediments deposited from water in which the individual grains are approximately of the size of silt, although the term is sometimes applied loosely to sediments containing considerable sand and clay.

Single grain. Each grain taken alone, as in sand; structureless. (*See also* Structure, soil.)

Slack-water soils. *See* Low bottoms.

Soil. The natural medium for the growth of land plants on the surface of the earth; soil is composed of organic and mineral materials.

Structure, soil. The arrangement of the individual grains and aggregates that make up the soil mass; this may refer to the natural arrangement of the particles when in place and undisturbed or to the soil at any degree of disturbance.

Subsoil. The B horizons of soils with distinct profiles. In soils with weak profile development, the subsoil is the soil below the plow layer (or its equivalent of surface soil), in which roots normally grow.

Substratum. Any layer lying beneath the solum or true soil. It is applied to both parent materials and to other layers unlike the parent material below the B horizon or the subsoil.

Surface runoff. Refers to the amount of water removed by flow over the surface of the soil. The amount and rapidity of surface runoff are affected by factors such as texture, structure, and porosity of the surface soil; the plant cover; the prevailing climate; and the slope. The degree of surface runoff is expressed by the terms *very rapid, rapid, medium, slow, very slow,* and *ponded.*

Surface soil. That part of the soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness; the A horizon.

Terrace (geological). An old alluvial plain, which is generally flat or smooth, bordering a stream, a lake, or the sea; frequently called a second bottom as contrasted to flood plain; seldom subject to overflow.

Texture, soil. Size of the individual particles making up the soil mass. The various soil separates, as sand, silt, and clay, determine texture. A coarse-textured soil is one high in content of sand; a fine-textured one contains a large proportion of clay.

Type, soil. A group of soils having genetic horizons similar as to differentiating characteristics, including texture and arrangement in the soil profile, and developed from a particular type of parent material.

Water-holding capacity. The capacity (or ability) of soil to hold water; field capacity is the amount held against gravity or 1 atmosphere tension or pF 2.7. The moisture-holding capacity of sandy soils is usually considered to be low, but that of clayey soils is high. Moisture-holding capacity is often expressed in inches of water per foot depth of soil. Terms for available water-holding capacity are—

Very high	12 or more inches per 60 inches of soil depth.
High	9 to 12 inches per 60 inches of soil depth.
Moderate	6 to 9 inches per 60 inches of soil depth.
Low	3 to 6 inches per 60 inches of soil depth.
Very low	Less than 3 inches per 60 inches of soil depth.

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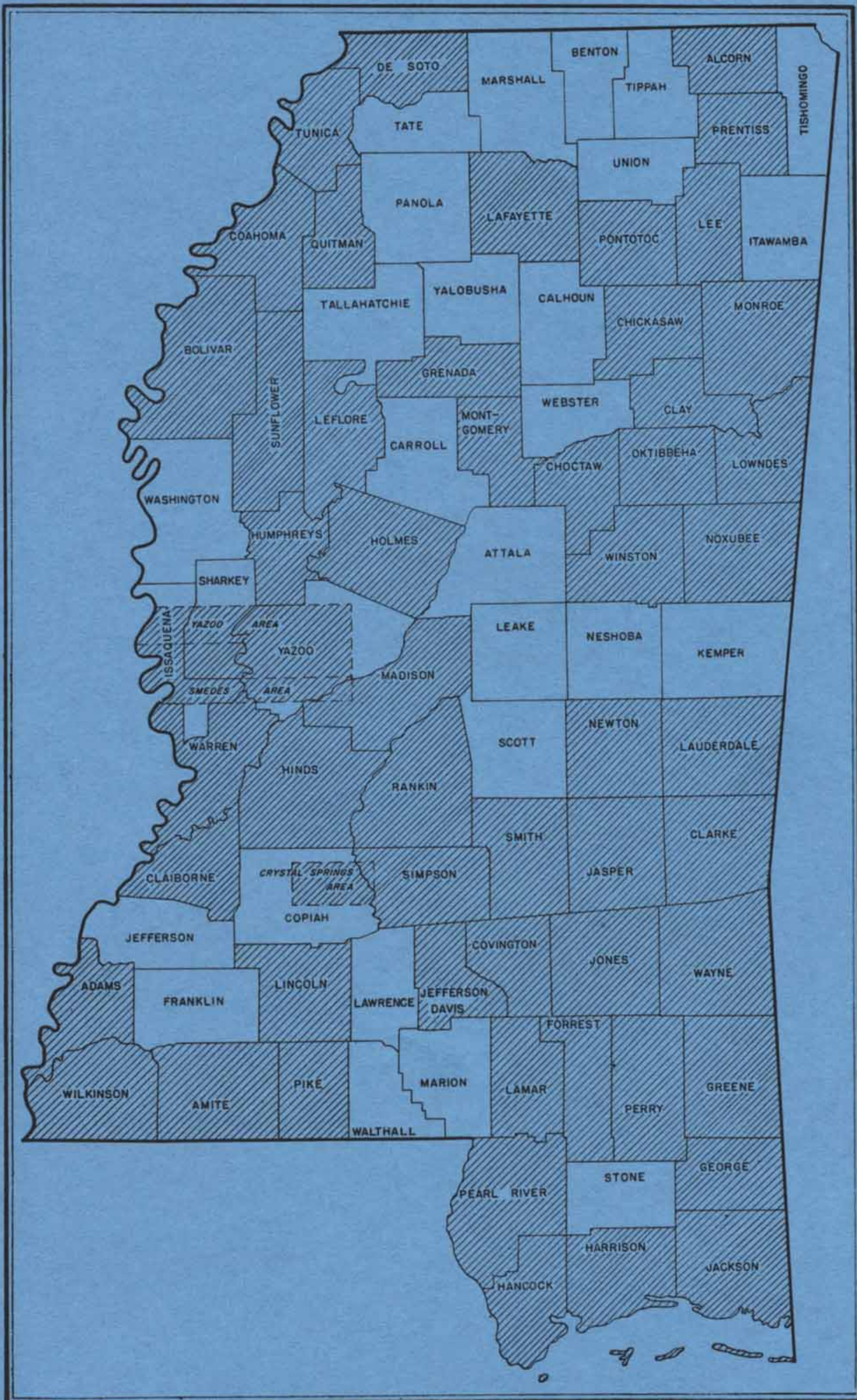

Areas surveyed in Mississippi shown by shading.

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